

APPENDIX C

Schematic Plans

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION

CALIFORNIA DEPARTMENT OF GENERAL SERVICES
AND
CALIFORNIA TAHOE CONSERVANCY
UPPER TRUCKEE RIVER AND MARSH
RESTORATION PROJECT



UPPER TRUCKEE RIVER
AND MARSH RESTORATION
PROJECT

E.I.P. # 560



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South Lake Tahoe, CA 96150
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295 Highway 50, suite 1
Zephyr Cove, NV 89448
Tel: 775.588.9069

TITLE SHEET

i

REVISIONS

#	description	date

scale: AS SHOWN

job no.: 00110066.04

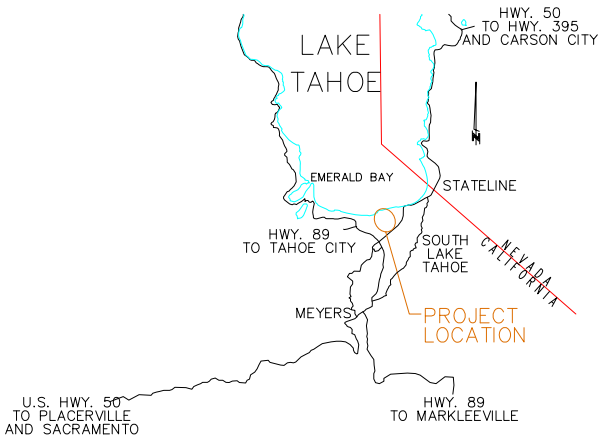
drawn by: MC

checked by: CM

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sheet 1 of 45

date: 01/10/13



VICINITY MAP

N.T.S



LOCATION MAP

SOUTH LAKE TAHOE, EL DORADO COUNTY, CA
SCALE 1" = 1000'



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17. ELEVATIONS SHOWN ON THE PLANS FOR PIPE INVERTS, TOPS OF GRATES, RIMS, CURBS, ETC., ARE BASED UPON THE TOPOGRAPHIC INFORMATION SHOWN ON THE PLANS. THE CONTRACTOR SHALL VERIFY ALL NECESSARY SURFACE ELEVATIONS IN THE FIELD AND NOTIFY THE DGS OF ANY DISCREPANCIES, WHICH MIGHT AFFECT PROPER OPERATION OF THE NEW FACILITIES BEFORE BREAKING GROUND AND PRIOR TO FACILITY INSTALLATION. THE DOT SHALL BE CONTACTED IN THE EVENT ELEVATIONS ARE INCORRECT SO THAT THE PROPER ADJUSTMENTS CAN BE MADE PRIOR TO THE INSTALLATION OF THE FACILITIES, AS SET FORTH IN THE SPECIAL PROVISIONS.
18. THE CONTRACTOR SHALL OBTAIN AT HIS OWN EXPENSE ALL PERMITS, LICENSES, INSURANCE POLICIES, ETC., NOT ALREADY OBTAINED BY DGS, AS MAY BE NECESSARY TO COMPLY WITH STATE AND LOCAL LAWS ASSOCIATED WITH THE PERFORMANCE OF THE WORK. SEE SPECIAL PROVISIONS.
19. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THE CONTRACT DOCUMENTS FOR ALL SUBMITTALS REQUIRED FOR DGS REVIEW AND ACCEPTANCE.
20. THE DGS WILL FURNISH THE CONSTRUCTION STAKING TO THE CONTRACTOR AS SET FORTH IN THE SPECIAL PROVISIONS.
21. CONTRACTOR SHALL NOTE THAT THE PLANS SHOW BOTH HORIZONTAL AND SLOPE (ACTUAL) LENGTHS FOR PIPE. SEE SPECIAL PROVISIONS FOR THE MAXIMUM ALLOWABLE DEFLECTION ANGLE AT EACH PIPE JOINT.
22. THE CONSULTANT TEAM AND OVERSEEING ENGINEER RESPONSIBLE FOR PREPARATION OF THESE PLANS AND SPECIFICATIONS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE CONSULTANT TEAM AND OVERSEEING ENGINEER RESPONSIBLE FOR PREPARATION OF THESE PLANS.
23. NO TREES OR WETLAND VEGETATION SHALL BE REMOVED UNLESS THEY ARE SHOWN AND NOTED TO BE REMOVED ON THE PLANS, OR AS DIRECTLY SPECIFIED ON-SITE BY THE PROJECT MANAGEMENT STAFF. ALL TREES CONFLICTING WITH GRADING SHALL BE TRIMMED. NO GRADING SHALL TAKE PLACE WITHIN THE DRIP LINE OF TREES NOT TO BE REMOVED UNLESS OTHERWISE APPROVED.
24. IF, DURING CONSTRUCTION, ARCHAEOLOGICAL REMAINS ARE ENCOUNTERED, CONSTRUCTION IN THE VICINITY SHALL BE HALTED, AND THE STATE OFFICE OF HISTORIC PRESERVATION AND A QUALIFIED ARCHEOLOGIST SHALL BE NOTIFIED IMMEDIATELY.
25. PERMIT CONDITIONS MAY CONTAIN SPECIFIC REQUIREMENTS FOR THE CONTROL OF OFF-SITE TURBIDITY FROM PROJECT OPERATIONS. TURBIDITY WILL BE MONITORED ON A FREQUENT BASIS BY THE PROJECT MANAGEMENT AND INSPECTION STAFF ON-SITE. TURBIDITY AMOUNTS IN EXCESS OF THE PERMITTED AMOUNT AND/OR DURATIONS WILL CAUSE WORK TO BE STOPPED UNTIL IMPROVED PRACTICES ARE IN EFFECT AND THE PROBLEMS CONTROLLED. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR ANY PROJECT DELAYS THAT OCCUR BY NATURE OF THIS FAILURE TO ADEQUATELY CONTAIN SEDIMENT ON-SITE
26. THE NEW CHANNEL ALIGNMENTS OF EACH ALTERNATIVE DEPICTED ON THE PLANS ARE APPROXIMATE AND ARE NOT INTENDED TO REPRESENT THE FINAL ALIGNMENT.

ABAND	ASPEN	FL	FLOWLINE
AC	ABANDONED	FS	FINISH SURFACE
AC	ASPHALT CONCRETE	G	GAS
APN	ASSESSOR'S PARCEL NUMBER	IE	INVERT ELEVATION
BLVD	BOULEVARD	INST	INSTALL
CA	CALIFORNIA	IB	ISOLATION BARRIER
CALC'S	CALCULATIONS	LF	LINEAR FEET
CF	CUBIC FEET OR CURB FACE	LT	LEFT
CIR	CIRCLE	LT BLVD	LAKE TAHOE BLVD
C	CENTERLINE	MISC	MISCELLANEOUS
CLF	CONSTRUCTION LIMIT FENCE	N	NORTH
CLR	CLEAR	NTS	NOT TO SCALE
CO.	COUNTY	OH	OVERHEAD
CONC	CONCRETE	P	PINE
CONST	CONSTRUCT	PL	PROPERTY LINE
CMP	CORRUGATED METAL PIPE	PP	POWER/UTILITY POLE
CT	CALTRANS OR COURT	PROP	PROPOSED
CTC	CALIFORNIA TAHOE CONSERVANCY	PUE	PUBLIC UTILITY EASEMENT
CY	CUBIC YARD	RD	ROAD
DET	DETAIL	REF	REFERENCE
DGS	DEPARTMENT OF GENERAL SERVICES	ROW	RIGHT-OF-WAY
DI	DRAINAGE INLET	RSP	ROCK SLOPE PROTECTION
DIA OR Ø	DIAMETER	RT	RIGHT
DISS	DISSIPATER	S	SOUTH OR SANITARY SEWER
DR	DRIVE	SD	STORM DRAIN
D/W	DRIVEWAY	SDMH	STORM DRAIN MANHOLE
E	EAST	SF	SQUARE FEET
EA	EACH	SHT	SHEET
EG	EXISTING GRADE	SS	SANITARY SEWER
ELEV	ELEVATION	ST	SEDIMENT TRAP OR STREET
ELEC	ELECTRIC	STA	STATION
EP	EDGE OF PAVEMENT	STPUD	SOUTH TAHOE PUBLIC UTILITY DISTRICT
EX	EXISTING	TRPA	TAHOE REGIONAL PLANNING AGENCY
F	FIR	TYP	TYPICAL
FES	FLARED END SECTION	USFS	UNITED STATES FOREST SERVICE
FF	FILTER FENCE	W	WEST OR WATER
FG	FINISHED GRADE	W/	WITH
FH	FIRE HYDRANT	W/O	WITHOUT

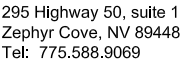
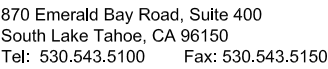
CABLE TELEVISION	CHARTER COMMUNICATIONS, (775) 850-1290	VERTICAL CONTROL IS NOT
NATURAL GAS	SOUTHWEST GAS CO., (775) 887-2872	PLANE, ZONE 2, NAD 83 (FE
ELECTRIC	LIBERTY ENERGY, (530) 541-2040	
SEWER & WATER	SOUTH TAHOE PUD, (530) 543-5247	
TELEPHONE	AT&T, (916) 453-6136	
STORM DRAIN	CITY OF SOUTH LAKE TAHOE, DPW (530) 542-6030	

VERTICAL CONTROL IS NGVD 29; HORIZONTAL CONTROL IS CALIFORNIA STATE PLANE, ZONE 2, NAD 83 (FEET):

NOTE: LEGEND PROVIDED ON SHEET SUPERCEDES THIS LEGEND

EXISTING	PROPOSED
 MAJOR CONTOUR	 FOOT TRAIL
 MINOR CONTOUR	 PIPE (MATERIAL AS NOTED)
 WATERS EDGE	 FILL
 STRUCTURE BOUNDARY	 CUT
 PROPERTY LINE	 BOULDER TOE PROTECTION
 FENCELINE	 NEW FLOODPLAIN
 FOOT TRAIL	 SCOUR POOL
 WATER LINE	 POINT BAR
 SEWER LINE	 ROCK DISSIPATER
 GAS LINE	 RESTORED DUNES
 STORM DRAIN	 STORMWATER TREATMENT AREA
 ELECTRIC LINE	 MAJOR CONTOUR
 AC PAVEMENT	 MINOR CONTOUR
 WOODEN FOOT BRIDGE	 TAHOE YELLOW CRESS PROTECTED AREA
 UTILITY EASEMENT	 BOARDWALK
 POWER/UTILITY POLE	 BRIDGE
 UTILITY POLE & GUY ANCHOR	 GRADE CONTROL STRUCTURE
 FIRE HYDRANT	 NEW CHANNEL ALIGNMENT
 DRAINAGE INLET	 RE-VEGETATION
 LIGHT POLE	
 MANHOLE	
 UTILITY BOX	
 SIGN	
 TREE, DIAMETER AND TYPE	
 EXISTING CHANNEL ALIGNMENT STATION NUMBER AND MARKER	 EXISTING RIVER ACCESS STABILIZATION

E.I.P. # 560



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#	description	date
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scale:	AS SHOWN
job no.:	00110066.04
drawn by:	MC
checked by:	CM

sheet 2 of 45
date: 01/10/13

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION

ALTERNATIVE ONE

YEAR 1

- MOBILIZATION, INCLUDING HAUL ROAD AND STAGING AREA CONSTRUCTION, BMP INSTALLATION, SIGNAGE PLACEMENT.
- CONSTRUCTION OF HIGH FLOW CHANNEL (STA 1700 - 2900)
- CLEARING AND GRUBBING ALONG THE EAST SIDE OF THE UPPER TRUCKEE RIVER AND INSTALL A THE ISOLATION BARRIER (IB).
- EXCAVATE THE EXISTING EASTERN HIGH FLOW CHANNEL.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS
- CONSTRUCTION OF NEW CHANNEL AND REGRADING OF LOWER WEST SIDE AREA (STA 6300-9300)
- CLEARING AND GRUBBING OF THE LOWER WEST SIDE AREA TO ALLOW FOR RE-GRADING OF THE FLOODPLAIN AND INSTALL AN IB.
- RE-GRADE AND REVEGETATE THE LOWER WEST SIDE AREA.
- A BULKHEAD/LEEVEE SHALL BE CONSTRUCTED ACROSS THE SAILING LAGOON TO SEGREGATE IT FROM THE TAHOE KEYS MARINA.
- INSTALL AN IB ALONG THE EXISTING CHANNEL ALIGNMENT TO SEPARATE THE RIVER FROM ITS FLOODPLAIN, AND THE NEW CHANNEL SHALL BE CONSTRUCTED.
- UPON COMPLETION OF ALL CHANNEL AND FLOODPLAIN WORK, ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.
- EAST MEADOW AND APPURTENANCES
- RE-ROUTE THE EXISTING TRAIL ACROSS THE NEW BULKHEAD/LEEVEE.
- AT THE END OF THE CONSTRUCTION SEASON, REMOVE IRRIGATION EQUIPMENT AND WINTERIZE THE SITE.

YEAR 2

BANK STABILIZATION (STA 0-1300)

- CLEARING AND GRUBBING FOR CONSTRUCTION OF THE ROCK TOE PROTECTION AND SCOUR POOL AND INSTALLATION OF THE ISOLATION BARRIER.
- EXCAVATE FLOODPLAIN AND CONSTRUCT POINT BAR.
- REVEGETATE AND IRRIGATE NEW FLOODPLAIN AND DISTURBED AREAS.

SEASONING OF HIGH FLOW CHANNEL (STA 1700 - 2900)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

VERTICAL GRADE CONTROL STRUCTURES (STA 2900-6300)

- DEWATER THE CHANNEL IN SECTIONS AND CONSTRUCT VERTICAL GRADE CONTROLS.
- ALL DISTURBED AREAS WILL BE REVEGETATED AND IRRIGATED.

RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- CLEAR AND GRUB FOR CONSTRUCTION OF A GRADE CONTROL STRUCTURE.
- RESTORE THE DUNES OF EAST COVE BEACH.
- ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.

SEASONING OF NEW CHANNEL AND IRRIGATION OF LOWER WEST SIDE AREA (STA 6300-9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

EAST MEADOW AND APPURTENANCES

- CONSTRUCT A CLASS I TRAIL SYSTEM THROUGH THE WOODED AREA NORTH OF HIGHLAND WOODS.
- CONSTRUCT A BOARDWALK AND OBSERVATION PLATFORMS ALONG THE EASTERN BOUNDARY.
- REMOVE FILL FROM BEHIND EAST BARTON BEACH.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

YEAR 3

BANK STABILIZATION (STA 0-1300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

DIVERSION TO HIGH FLOW CHANNEL (STA 1700 - 2900)

- REMOVE IB AND PUT THE RIVER IN THE NEW ALIGNMENT. FLUSH THE NEW CHANNEL TO INITIATE THE FLOWS.
- PLACE IB TO THE OLD SECTION OF CHANNEL. BACKFILL OLD CHANNEL AND REVEGETATE.
- INSTALL LATERAL GRADE CONTROL STRUCTURES AT THE UPSTREAM AND DOWNSTREAM ENDS OF THIS SECTION.
- REMOVE IB AND REVEGETATE AND IRRIGATE ALL DISTURBED.

VERTICAL GRADE CONTROL STRUCTURES (STA 2900-6300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.
- RESTORE THE SETTLING BASIN AND TKPOA CORPORATION YARD. ALL DISTURBED AREAS WILL BE REVEGETATED AND IRRIGATED.

DIVERSION TO NEW CHANNEL AND ABANDONMENT OF EXISTING CHANNEL (STA 6300-9300)

- PUT THE RIVER IN THE NEW ALIGNMENT AND MOVE IB TO ISOLATE THE OLD CHANNEL. DIVERT WATER FROM THE RIVER TO THE SAILING LAGOON TO ALLOW SETTLEMENT.
- THE NEW CHANNEL SECTION SHALL BE FLUSHED TO INITIATE THE FLOWS, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.
- CONVERGENCE OF NEW ALIGNMENT AND OLD ALIGNMENT WILL BE ARMORED WITH A COMBINATION OF VINYL SHEET PILE, ROCK AND LARGE WOOD ELEMENTS. WILLOW STAKES WILL BE INCORPORATED INTO THESE ENGINEERED AREAS AND PROPAGATED SOD WILL BE PLACED ON TOP OF THE ARMORED PROTECTION.

SEASONING OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- THE NEW CHANNEL AND FLOODPLAIN WILL BE ALLOWED TO ESTABLISH VEGETATION AND SEASONED. IRRIGATION LINES WILL BE PLACED AS SOON AS POSSIBLE AND REVEGETATION INSPECTIONS WILL BE ON A MONTHLY BASIS.

EAST MEADOW AND APPURTENANCES

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

YEAR 4

IRRIGATION AND VEGETATION MONITORING OF HIGH FLOW CHANNEL (STA 1700 - 2900) & VERTICAL GRADE CONTROL STRUCTURES (STA 2900-6300)& NEW CHANNEL AND LOWER WEST SIDE AREA (STA 6300-9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

DIVERSION TO RIVER MOUTH RE-CONFIGURATION (STA 9300 -10700)

- PLACE THE RIVER IN THE NEW ALIGNMENT AND RE-INSTALLING IB TO ISOLATE THE OLD SECTION OF CHANNEL.
- THE NEW CHANNEL WILL BE FLUSHED SEVERAL TIMES, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- INSTALL INTERPRETIVE SIGNAGE THROUGHOUT THE SITE.
- CONSTRUCT CLASS I BIKE TRAIL ALONG VENICE DRIVE.
- CONSTRUCT A VISITOR'S CENTER AND PARKING LOT AT THE END OF VENICE DRIVE.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

ALTERNATIVE TWO

YEAR 1

- MOBILIZATION, INCLUDING HAUL ROAD AND STAGING AREA CONSTRUCTION, BMP INSTALLATION, AND SIGNAGE PLACEMENT.
- CONSTRUCTION OF NEW GEOMORPHIC CHANNEL AND REGRADING OF LOWER WEST SIDE AREA (STA 2000 - 9300)
- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER AND INSTALLATION OF THE IB.
- RE-GRADING OF THE LOWER WEST SIDE AREA.
- CONSTRUCT THE BULKHEAD/LEEVEE ACROSS THE SAILING LAGOON.
- INSTALL AN IB ALONG THE EXISTING CHANNEL ON THE SIDE ADJACENT TO THE NEW CHANNEL, AND CONSTRUCT THE NEW CHANNEL.
- UPON COMPLETION OF ALL CHANNEL AND FLOODPLAIN WORK, ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.
- EAST MEADOW AND APPURTENANCES
- RE-ROUTE THE EXISTING TRAIL ACROSS THE NEW BULKHEAD/LEEVEE.

YEAR 2

BANK STABILIZATION (STA 0-2000)

- CLEARING AND GRUBBING FOR CONSTRUCTION OF THE ROCK TOE PROTECTION AND SCOUR POOL AND INSTALL THE IB.
- CONSTRUCT ROCK TOE PROTECTION.
- EXCAVATE SECONDARY CHANNEL MOUTH AND CONSTRUCT POINT BAR.
- EXCAVATE FLOODPLAIN LOCATIONS
- REVEGETATE AND IRRIGATE NEW FLOODPLAIN AND DISTURBED AREAS AT THE CONCLUSION OF CONSTRUCTION.

SEASONING OF NEW GEOMORPHIC CHANNEL AND VEGETATION ESTABLISHMENT OF LOWER WEST SIDE AREA (STA 1300 - 9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER AND INSTALLATION OF THE IB.
- CONSTRUCT NEW CHANNEL WITH VERTICAL GRADE CONTROLS
- THE DUNES AREA SHALL BE RESTORED ACCORDING TO THE PLANS AND SPECIFICATIONS.
- ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- CONSTRUCT OBSERVATION PLATFORMS ALONG THE EASTERN BOUNDARY.
- REMOVE FILL FROM BEHIND EAST BARTON BEACH
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

YEAR 3

BANK STABILIZATION (STA 0-2000)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

DIVERSION TO NEW GEOMORPHIC CHANNEL; ABANDONMENT OF EXISTING CHANNEL; VEGETATION ESTABLISHMENT OF LOWER WEST SIDE AREA (STA 2000 - 9300)

- REMOVE IB AND PUT RIVER IN THE NEW ALIGNMENT. INSTALL IB TO ISOLATE FOR BACKFILL OF OLD RIVER ALIGNMENT.
- THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.
- WHERE THE NEW ALIGNMENT AND EXISTING ALIGNMENT CONVERGE WILL BE ARMORED WITH A COMBINATION OF VINYL SHEET PILE, ROCK AND LARGE WOOD ELEMENTS. WILLOW STAKES WILL BE INCORPORATED INTO THESE ENGINEERED AREAS AND PROPAGATED SOD WILL BE PLACED ON TOP OF THE ARMORED PROTECTION.
- CONSTRUCT A VERTICAL GRADE CONTROL STRUCTURE ON THE UPSTREAM END OF THIS SECTION.
- STORMWATER TREATMENT AREAS SHALL BE CONSTRUCTED IN THE FLOODPLAIN NEAR THE TKPOA YARD.
- RESTORE THE SETTLING BASIN AND TKPOA CORPORATION YARD.
- ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.

SEASONING OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)& EAST MEADOW AND APPURTENANCES

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

YEAR 4

IRRIGATION AND VEGETATION MONITORING OF NEW GEOMORPHIC CHANNEL; EXISTING CHANNEL; LOWER WEST SIDE AREA (STA 2000 - 9300)

- AS EARLY AS POSSIBLE, AN INSPECTION WILL BE COMPLETED TO EVALUATE THE CONDITION OF IMPROVEMENTS.
- IRRIGATION LINES WILL BE PLACED AS SOON AS POSSIBLE AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.
- CONSTRUCT FISHING PLATFORM

DIVERSION INTO RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- THIS YEAR THE RIVER SHALL BE PUT IN THE NEW ALIGNMENT BY REMOVING THE IB AND RE-INSTALLING IT TO ISOLATE THE OLD SECTION OF CHANNEL.
- THE NEW CHANNEL SECTION SHALL BE FLUSHED SEVERAL TIMES TO INITIATE THE FLOWS, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- INSTALL INTERPRETIVE SIGNAGE THROUGHOUT THE SITE.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

ALTERNATIVE THREE

YEAR 1

- MOBILIZATION, INCLUDING HAUL ROAD AND STAGING AREA CONSTRUCTION, BMP INSTALLATION, SIGNAGE PLACEMENT.
- CONSTRUCTION OF NEW GEOMORPHIC PILOT CHANNEL AND REGRADING OF LOWER WEST SIDE AREA (STA 3000-9300)
- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER TO INSTALL AN IB. EXCAVATE A PILOT CHANNEL.
- REGRADE THE LOWER WEST SIDE AREA.
- A BULKHEAD SHALL BE CONSTRUCTED ACROSS THE SAILING LAGOON TO SEGREGATE IT FROM THE TAHOE KEYS MARINA.
- INSTALL IB TO ISOLATE THE UPPER TRUCKEE RIVER FROM ITS FLOODPLAIN IN THE VICINITY OF THE NEW PILOT CHANNEL.
- EXCAVATE THE NEW PILOT CHANNEL (~1800').
- THE CONTRACTOR SHALL INSTALL A VERTICAL GRADE CONTROL
- THE NEW FLOODPLAIN, CHANNEL AND ANY DISTURBED AREAS WILL BE REVEGETATED AND IRRIGATED.
- EAST MEADOW AND APPURTENANCES
- RE-ROUTE THE EXISTING TRAIL ACROSS THE NEW BULKHEAD LEEVEE.

YEAR 2

CONSTRUCTION OF BANK STABILIZATION AND OVERBANK CONVEYANCE (STA 0-1300)

- CLEARING AND GRUBBING FOR CONSTRUCTION OF THE ROCK TOE PROTECTION AND SCOUR POOL AND INSTALLATION OF THE ISOLATION BARRIER.
- EXCAVATE FLOODPLAIN AND CONSTRUCT POINT BAR.
- CONSTRUCT TWO 48" CMP ARCH PIPES BENEATH HWY 50 TO THE WEST OF THE BRIDGE STRUCTURE.
- CONSTRUCT A ROCK HEADWALL UPSTREAM, AND A ROCK DISSIPATER SHALL BE INSTALLED AT THE DOWNSTREAM END.
- REVEGETATE AND IRRIGATE NEW FLOODPLAIN AND DISTURBED AREAS.

CONSTRUCTION OF LOWERED FLOODPLAIN (STA 1700 - 3000)

- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER TO ALLOW FOR CONSTRUCTION OF NEW FLOODPLAIN.
- EXCAVATE THE EXISTING FLOODPLAIN. REVEGETATION AND IRRIGATION OF NEW FLOODPLAIN AND DISTURBED AREAS SHALL COMMENCE AT THE CONCLUSION OF CONSTRUCTION.

SEASONING OF NEW GEOMORPHIC PILOT CHANNEL AND LOWER WEST SIDE AREA (STA 3000-9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

CONSTRUCTION OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- CLEARING AND GRUBBING WILL BE COMPLETED TO ALLOW FOR INSTALLATION OF THE GRADE CONTROL STRUCTURE.
- INSTALL AN IB AND CONSTRUCT THE GRADE CONTROL STRUCTURE
- RESTORE THE DUNES AT EAST COVE BEACH.
- ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- CONSTRUCT TRAILS AND BOARDWALKS, AND OBSERVATION PLATFORMS ALONG THE EASTERN BOUNDARY.
- CONSTRUCT LOOP TRAIL THROUGH WOODS NORTH OF HIGHLAND WOODS.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

YEAR 3

IRRIGATION AND VEGETATION ESTABLISHMENT OF BANK STABILIZATION & OVERBANK CONVEYANCE (STA 0-1300)

- AS EARLY AS POSSIBLE, AN INSPECTION WILL BE COMPLETED TO EVALUATE THE CONDITION OF IMPROVEMENTS.
- IRRIGATION LINES WILL BE PLACED AS SOON AS POSSIBLE AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

IRRIGATION AND VEGETATION ESTABLISHMENT OF LOWERED FLOODPLAIN (STA 1300 - 3000)

- AS EARLY AS POSSIBLE, AN INSPECTION WILL BE COMPLETED TO EVALUATE THE CONDITION OF IMPROVEMENTS.
- IRRIGATION LINES WILL BE PLACED AS SOON AS POSSIBLE AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

DIVERSION TO NEW GEOMORPHIC PILOT CHANNEL AND ABANDONMENT OF EXISTING CHANNEL (STA 3000-9300)

- THIS YEAR, THE RIVER WILL BE PUT IN THE NEW ALIGNMENT BY REMOVING THE ISOLATION BARRIER AND RE-INSTALLING IT TO ISOLATE THE OLD SECTION OF CHANNEL. THE RIVER FLOW WILL BE DIVERTED TO THE PILOT CHANNEL AND ALLOWED TO FIND ITS OWN PATH BACK TO LAKE TAHOE.
- AFTER THE WATER IS DIVERTED TO THE NEW CHANNEL, THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.
- CONVERGENCE OF THE NEW ALIGNMENT AND OLD ALIGNMENT CONVERGE WILL BE ARMORED WITH A COMBINATION OF ROCK AND LARGE WOOD ELEMENTS. WILLOW STAKES WILL BE INCORPORATED INTO THESE ENGINEERED AREAS AND PROPAGATED SOD WILL BE PLACED AS NEEDED ON TOP OF THE ARMORED PROTECTION.

SEASONING OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700) & EAST MEADOW AND APPURTENANCES

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

YEAR 4

IRRIGATION AND VEGETATION ESTABLISHMENT OF NEW GEOMORPHIC PILOT CHANNEL, EXISTING CHANNEL, AND LOWER WEST SIDE AREA (STA 3000-9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.
- STORMWATER TREATMENT AREAS SHALL BE CONSTRUCTED IN THE FLOODPLAIN NEAR THE TKPOA YARD AND THE TKPOA YARD SHALL BE RESTORED ACCORDING TO THE PLANS AND SPECIFICATIONS. ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED.

DIVERSION TO RIVER MOUTH RE-CONFIGURATION (STA 9300 -10700)

- THIS YEAR THE RIVER WILL BE PUT IN THE NEW ALIGNMENT BY REMOVING THE ISOLATION BARRIER AND RE-INSTALLING IT TO ISOLATE THE OLD SECTION OF CHANNEL.
- THE NEW CHANNEL WILL BE FLUSHED SEVERAL TIMES TO INITIATE THE FLOWS, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- INSTALL INTERPRETIVE SIGNAGE THROUGHOUT THE SITE.
- CONSTRUCT SELF-SERVE KIOSK AT THE END OF VENICE DRIVE

ALTERNATIVE FOUR

YEAR 1

- MOBILIZATION, INCLUDING HAUL ROAD AND STAGING AREA CONSTRUCTION, BMP INSTALLATION, AND SIGNAGE PLACEMENT.
- CONSTRUCTION OF NEW CHANNEL AND REGRADING OF LOWER WEST SIDE AREA (STA 6700-9300)
- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER TO ALLOW FOR INSTALLATION OF THE IB, EXCAVATE THE NEW CHANNEL AND REGRADE THE LOWER WEST SIDE AREA.
- INSTALL THE IB TO ISOLATE THE UPPER TRUCKEE RIVER FROM ITS FLOODPLAIN IN THE VICINITY OF LOWER WEST SIDE.
- THE NEW FLOODPLAIN, CHANNEL AND ANY DISTURBED AREAS WILL BE REVEGETATED AND IRRIGATED.
- CONSTRUCTION OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)
- CLEARING AND GRUBBING WILL BE COMPLETED TO ALLOW FOR RE-CONFIGURATION OF THE CHANNEL MOUTH.
- INSTALL AN IB AND DEWATER THE CHANNEL.
- REGRADE THE MOUTH AREA THE AND USE LOCAL CUT AND FILL TO REGRADE THE MOUTH AREA TO THE LINES AND GRADES DEPICTED IN THE DRAWINGS.
- WHEN CONSTRUCTION IS COMPLETE, THE WATER WILL BE RETURNED TO THE CHANNEL AND THE TEMPORARY DIVERSION WILL BE REMOVED.
- ALL DISTURBED AREAS SHALL BE REVEGETATED AND IRRIGATED FOR ONE YEAR.

YEAR 2

CONSTRUCTION OF BANK STABILIZATION & INSET FLOODPLAIN (STA 0-1300)

- CLEARING AND GRUBBING FOR CONSTRUCTION OF THE ROCK TOE PROTECTION AND SCOUR POOL AND INSTALLATION OF THE ISOLATION BARRIER. CONSTRUCT ROCK TOE PROTECTION.
- EXCAVATE FLOODPLAIN AND CONSTRUCT POINT BAR.
- REVEGETATE AND IRRIGATE NEW FLOODPLAIN AND DISTURBED AREAS.

CONSTRUCTION OF INSET FLOODPLAIN (STA 1300 - 6700)

- CLEARING AND GRUBBING ALONG THE UPPER TRUCKEE RIVER TO ALLOW FOR CONSTRUCTION OF NEW FLOODPLAIN.
- EXCAVATE THE EXISTING FLOODPLAIN.
- REVEGETATION AND IRRIGATION OF NEW FLOODPLAIN AND DISTURBED AREAS.

SEASONING OF NEW CHANNEL AND LOWER WEST SIDE AREA (STA 6700-9300) & SEASONING OF RIVER MOUTH RE-CONFIGURATION (STA 9300-10700)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

EAST MEADOW AND APPURTENANCES

- CONSTRUCT TRAILS AND BOARDWALKS, AND OBSERVATION PLATFORMS ALONG THE EASTERN BOUNDARY ACCORDING TO THE PLANS AND SPECIFICATIONS.
- CONSTRUCT A PERIMETER CLASS I BIKE TRAIL ALONG THE SOUTHERN BORDER OF THE SITE.
- REVEGETATE AND IRRIGATE ALL DISTURBED AREAS.

YEAR 3

SEASONING OF BANK STABILIZATION & INSET FLOODPLAIN (STA 0-1300) & SEASONING OF INSET FLOODPLAIN (STA 1300 - 6700)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

DIVERSION TO NEW CHANNEL AND ABANDONMENT OF EXISTING CHANNEL (STA 6700-9300)

- THIS YEAR, THE RIVER WILL BE PUT IN THE NEW ALIGNMENT BY REMOVING THE ISOLATION BARRIER AND RE-INSTALLING IT TO ISOLATE THE OLD SECTION OF CHANNEL.
- AS EACH SECTION OF NEW CHANNEL IS BROUGHT ON-LINE, THE NEW CHANNEL SECTION SHALL BE FLUSHED SEVERAL TIMES TO INITIATE THE FLOWS, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.
- THE LOCATIONS WHERE THE NEW ALIGNMENT AND EXISTING ALIGNMENT CONVERGE WILL BE ARMORED WITH A COMBINATION OF ROCK AND LARGE WOOD ELEMENTS. WILLOW STAKES WILL BE INCORPORATED INTO THESE ENGINEERED AREAS AND PROPAGATED SOD WILL BE PLACED AS NEEDED ON TOP OF THE ARMORED PROTECTION.
- THE NEW FLOODPLAIN, ABANDONED CHANNEL, AND ANY DISTURBED AREAS WILL BE IRRIGATED AND MONITORED FOR ONE YEAR FOLLOWING COMPLETION OF CONSTRUCTION.

DIVERSION TO RIVER MOUTH RE-CONFIGURATION (STA 9300 -10700)

- THIS YEAR THE RIVER WILL BE PUT IN THE NEW ALIGNMENT BY REMOVING THE ISOLATION BARRIER AND RE-INSTALLING IT TO ISOLATE THE OLD SECTION OF CHANNEL.
- THE NEW CHANNEL WILL BE FLUSHED SEVERAL TIMES TO INITIATE THE FLOWS, AND THE OLD CHANNEL WILL BE BACKFILLED, REVEGETATED, AND IRRIGATED.

EAST MEADOW AND APPURTENANCES

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

YEAR 4

IRRIGATION AND VEGETATION ESTABLISHMENT OF NEW CHANNEL, EXISTING CHANNEL, AND LOWER WEST SIDE AREA (STA 6700-9300)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

IRRIGATION AND VEGETATION ESTABLISHMENT OF RIVER MOUTH RE-CONFIGURATION (STA 9300 -10700)

- IRRIGATION LINES WILL BE PLACED AND REVEGETATION INSPECTIONS WILL BE COMPLETED ON A MONTHLY BASIS.

EAST MEADOW AND APPURTENANCES

- INSTALL INTERPRETIVE SIGNAGE THROUGHOUT THE SITE.
- CONSTRUCT SELF-SERVE KIOSK AT THE END OF VENICE DRIVE.



UPPER TRUCKEE RIVER
AND MARSH RESTORATION
PROJECT

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CONSTRUCTION
PHASING

iii

REVISIONS

#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	MC
checked by:	CM

sheet no.: iii

sheet 3 of 45
date: 01/10/13

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION

Legend

Existing 1000 ft. River Station

Existing 100 ft. River Station - Upper Truckee

Existing 100 ft. River Station - Trout Creek

Existing Regional Bike Trail

Proposed Habitat Features (See Sheet L-12)

Core Habitat Area

Lagoon

Restored Meadow

Restored Dune

Tahoe Yellow Cress Restricted Use Area

Proposed River and Floodplain Features

Low and Bankful Flow Channel

Partial Fill of Existing Channel

Removal of Reserve Fill

Active Floodplain

Proposed Engineered Features

Lateral Grade Control

Vertical Grade Control

Bank Protection

Bulkhead/Levee

Proposed Public Access Features

Observation Area

Viewpoint

Kiosk

Parking

Bike Path

Pedestrian Trail

Bridge

Boardwalk

0400800

Feet

0

400

800

The map illustrates the Upper Truckee River and Marsh Restoration Project, showing the river's course through various subdivisions and public access points. Key features include:

- Subdivisions:** Tahoe Island Subdivision, Tahoe Keys Subdivision, Highland Woods Subdivision, and Al Tahoe Subdivision.
- Public Access Features:** Observation Areas (marked with 'i' icons), Viewpoints (marked with 'V' icons), Kiosks (marked with 'K' icons), Parking (marked with 'P' icons), Bike Paths (marked with 'B' icons), Pedestrian Trails (marked with 'T' icons), Bridges (marked with 'BR' icons), and Boardwalks (marked with 'BW' icons).
- Elevations:** The map shows elevations ranging from 0 to 10,000 feet, with specific markers at 0, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, and 10000.
- Sheet Boundaries:** The map is divided into five sheets: SHEET C-1, SHEET C-2, SHEET C-3, SHEET C-4, and SHEET C-5.
- Geographic Features:** The map includes the Tahoe Keys Marina, Lower West Side Restoration Area, Cove East Beach, and Barton Beach.
- Infrastructure:** The map shows major roads such as U.S. Highway 50 / Lake Tahoe Boulevard, Tahoe Keys Boulevard, Verice Drive, Springwood Drive, Macinaw Road, El Dorado Avenue, Placer Avenue, Capistrano Avenue, Stanford Avenue, Los Angeles Avenue, San Francisco Avenue, and Lakeview Avenue.

DGS

NATIONAL TAHOE RESTORATION

UPPER TRUCKEE RIVER AND MARSH RESTORATION PROJECT

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ALTERNATIVE 1

CHANNEL AGGRADATION AND NARROWING
MAXIMUM RECREATION INFRASTRUCTURE

S-1

REVISIONS

#	description	date

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job no. : 00110066.04

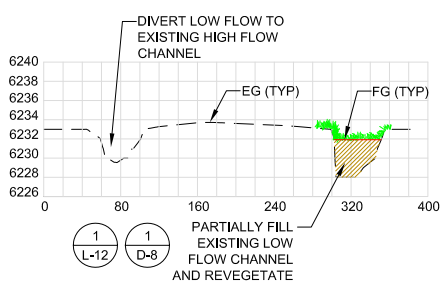
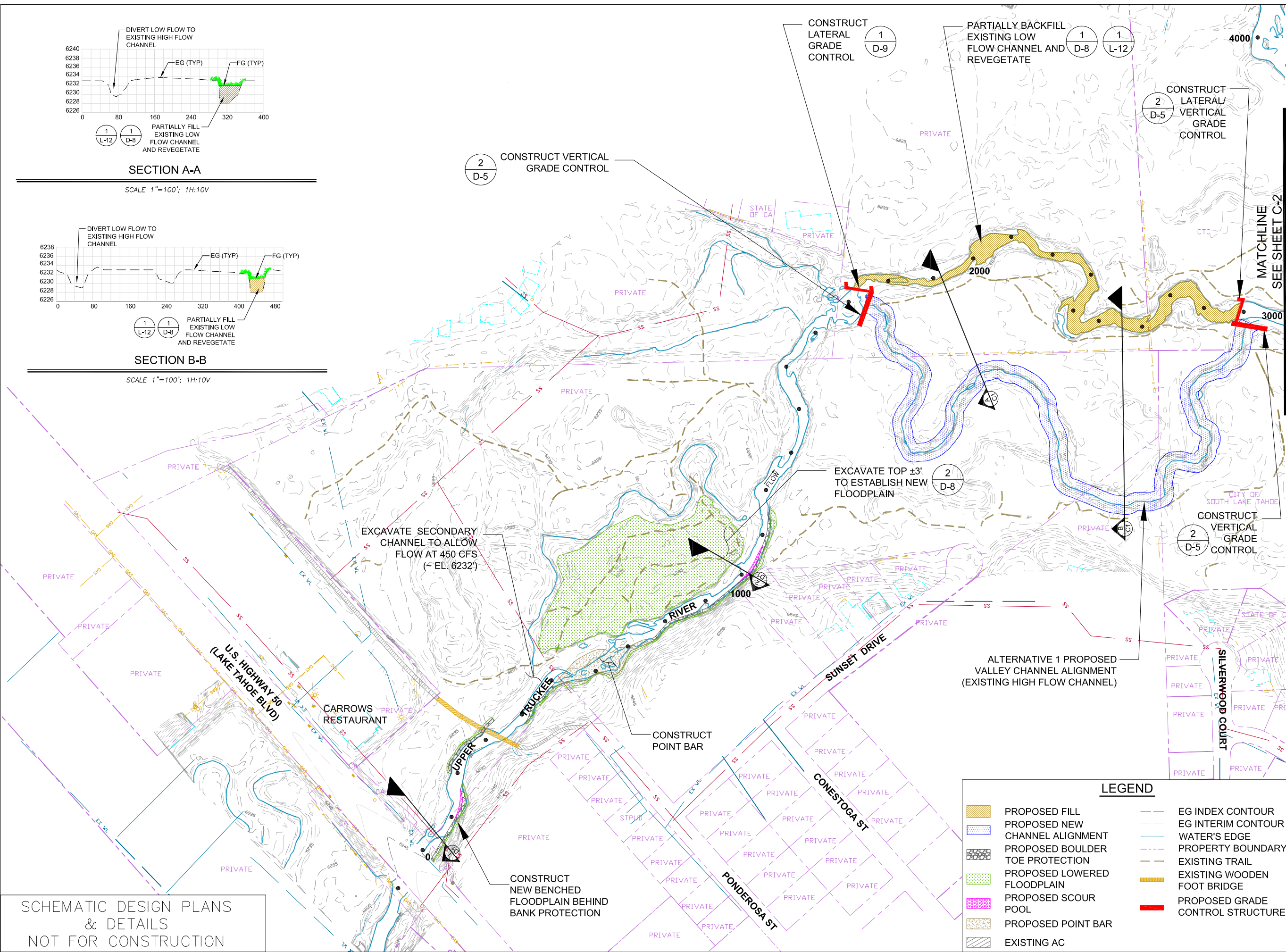
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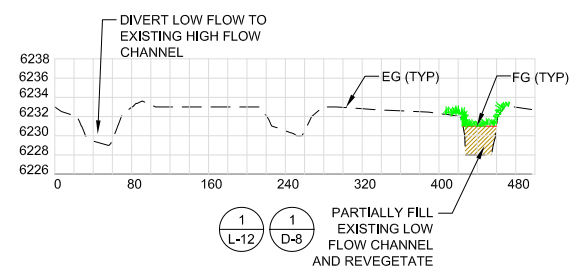
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sheet 4 of 45

date : 11/07/12



SECTION A-A
SCALE 1"=100'; 1H:10V



SECTION B-B
SCALE 1"=100'; 1H:10V

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION

LEGEND

PROPOSED FILL	EG INDEX CONTOUR
PROPOSED NEW CHANNEL ALIGNMENT	EG INTERIM CONTOUR
PROPOSED BOULDER TOE PROTECTION	WATER'S EDGE
PROPOSED LOWERED FLOODPLAIN	PROPERTY BOUNDARY
PROPOSED SCOUR POOL	EXISTING TRAIL
PROPOSED POINT BAR	EXISTING WOODEN FOOT BRIDGE
EXISTING AC	PROPOSED GRADE CONTROL STRUCTURE

UPPER TRUCKEE RIVER AND MARSH RESTORATION PROJECT

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UPSTREAM REACH PLAN RS 0 - 3000 (ALTERNATIVE 1)

C-1

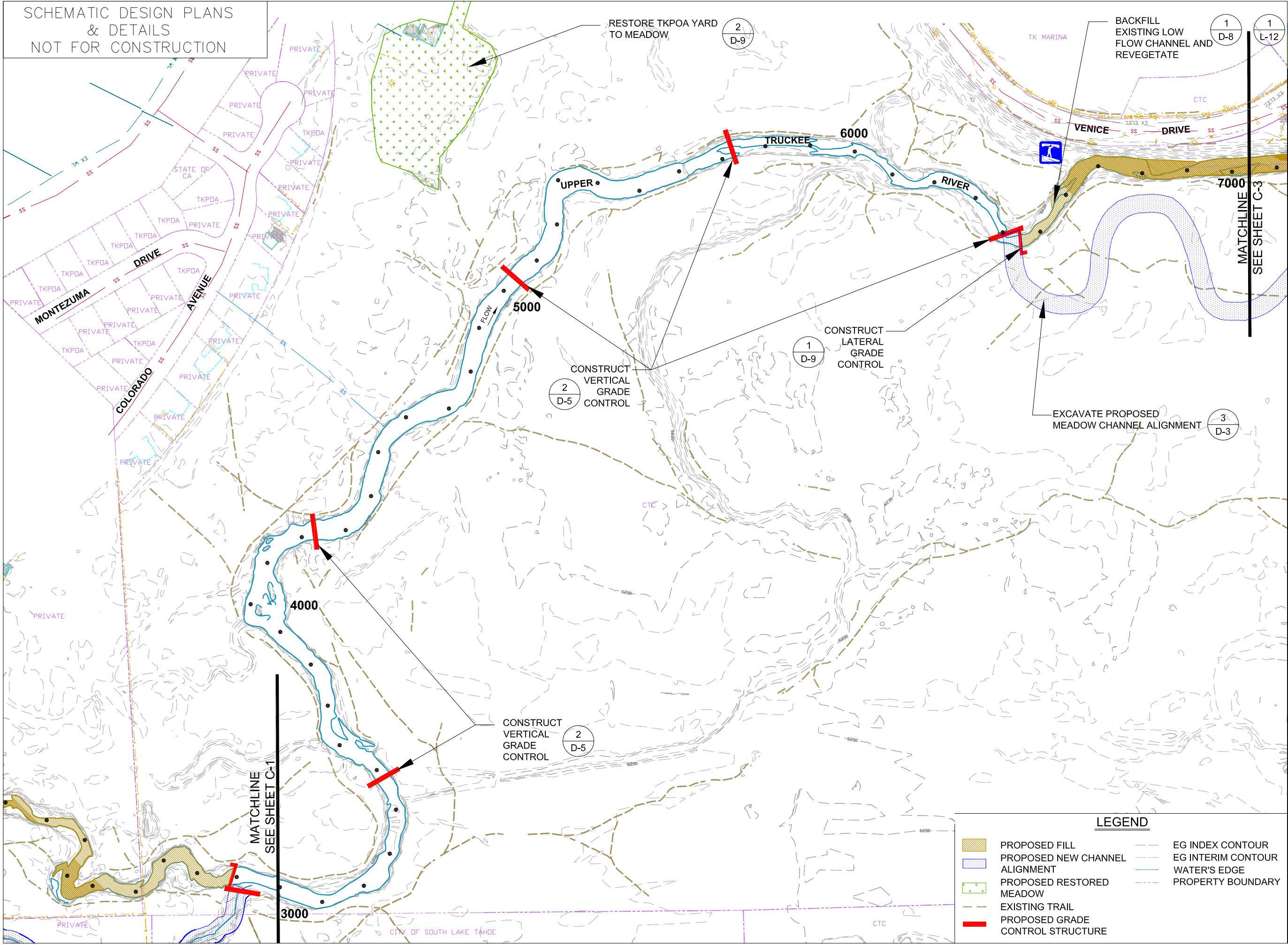
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scale: AS SHOWN
job no.: 00110066.04
drawn by: CK
checked by: CM

sheet no.: C-1

sheet 5 of 45
date: 11/20/07

SCHEMATIC DESIGN PLANS
& DETAILS
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UPPER TRUCKEE RIVER
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MID-MARSH
PLAN
RS 3000 - 7000
(ALTERNATIVE 1)

C-2

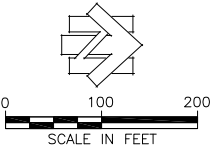
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job no.:	00110066.04
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sheet no.: C-2

sheet 6 of 45
date: 11/20/07



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DOWNSTREAM REACH
PLAN
RS 7000 - 10100
(ALTERNATIVE 1)

C-3

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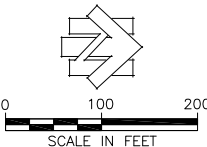
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sheet 7 of 45

date: 11/20/0



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DOWNSTREAM REACH
RS 7000 - 10700
CROSS SECTIONS
(ALTERNATIVE 1)

C-4

REVISIONS

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job no.: 00110066.04

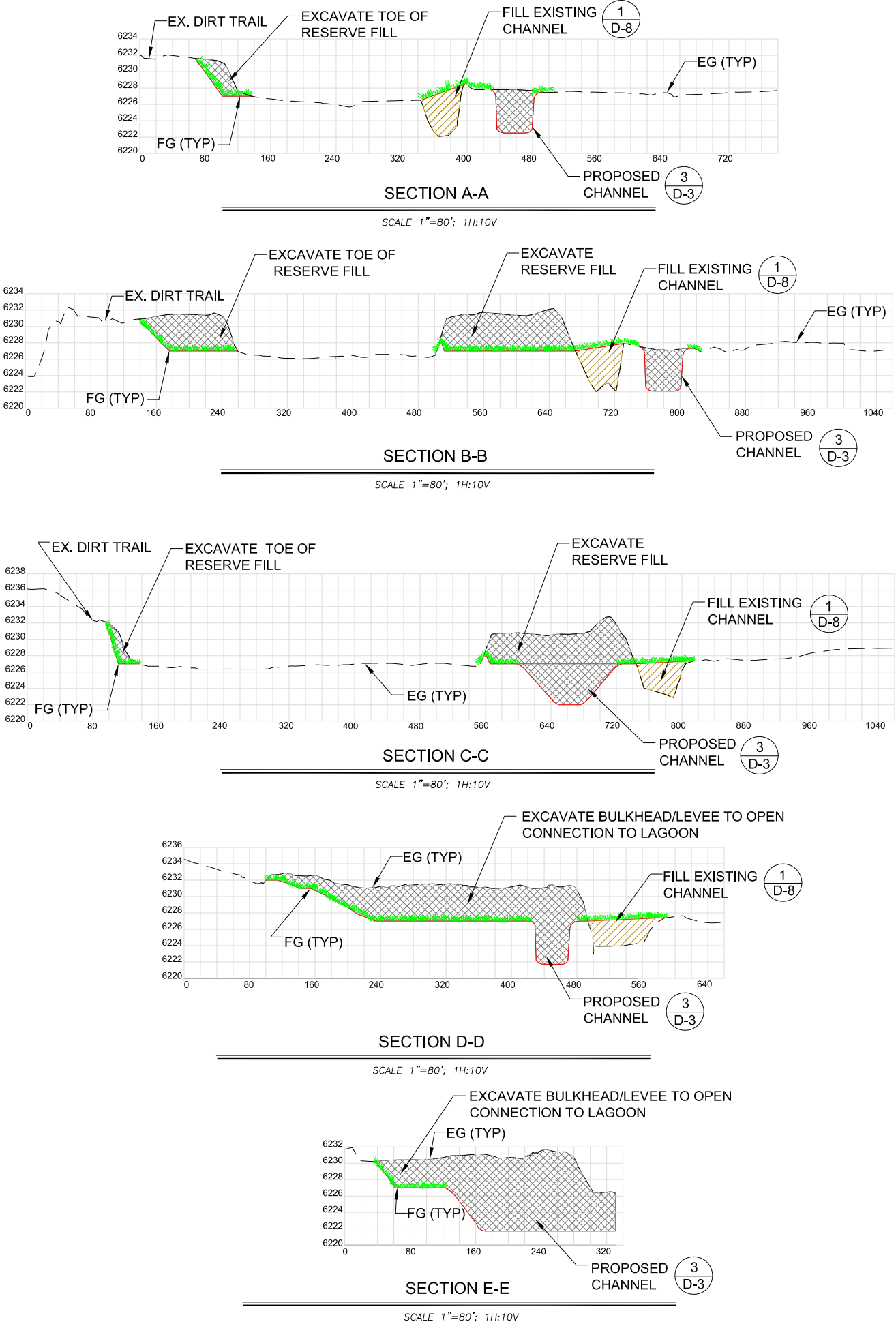
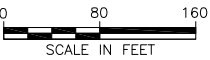
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checked by: CM

sheet no.: C-4

sheet 8 of 45

date: 11/20/07



LEGEND	
	PROPOSED CUT
	PROPOSED FILL
	PROPOSED REVEGETATION

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION

PROPOSED RESTORED LAGOON

PROPOSED CHANNEL ALIGNMENT

PROPOSED RESTORED DUNE

PROPOSED TYPE 2 OBSERVATION PLATFORM

6229' LAKE TAHOE HIGH WATER

EG INDEX CONTOUR

EG INTERIM CONTOUR

PROPOSED TAHOE YELLOW CRESS RESTRICTED AREA

PROPOSED BIKE PATH

WATER'S EDGE

PROPERTY BOUNDARY

PROPOSED BOARDWALK

PROPOSED BRIDGE

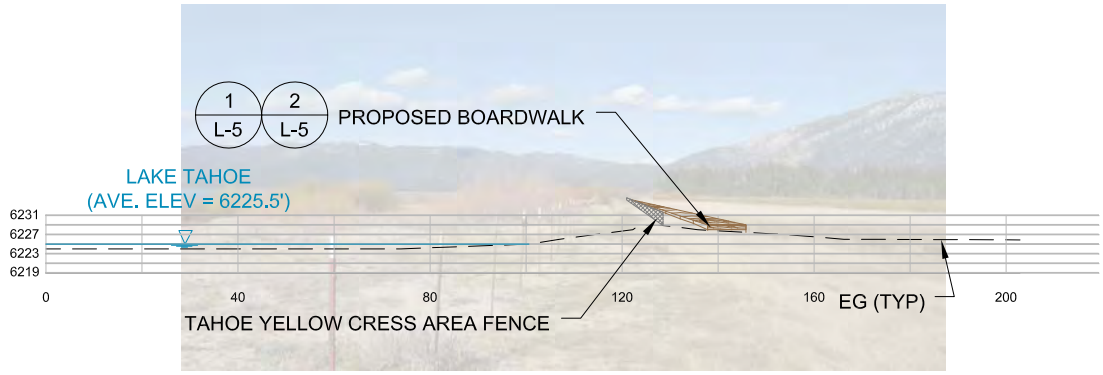
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L-1

3

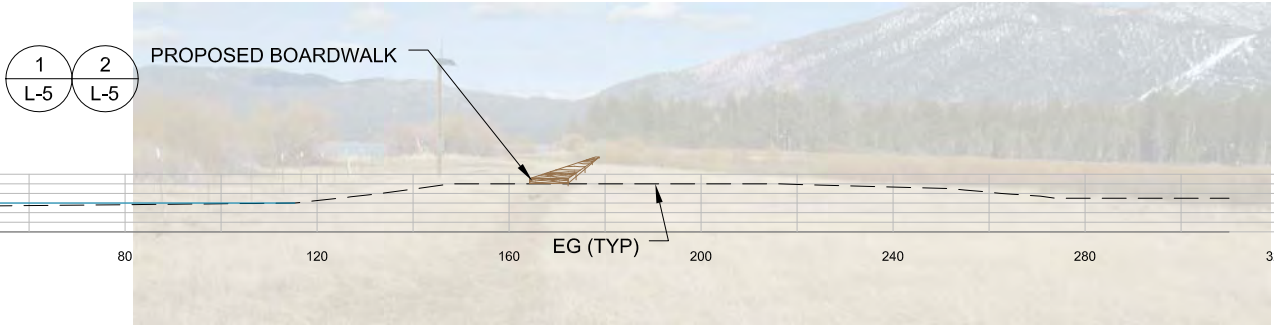
L-7

SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION



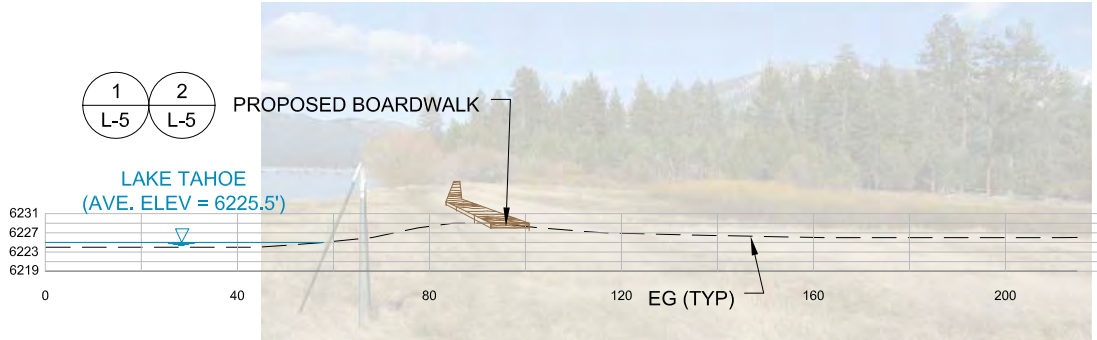
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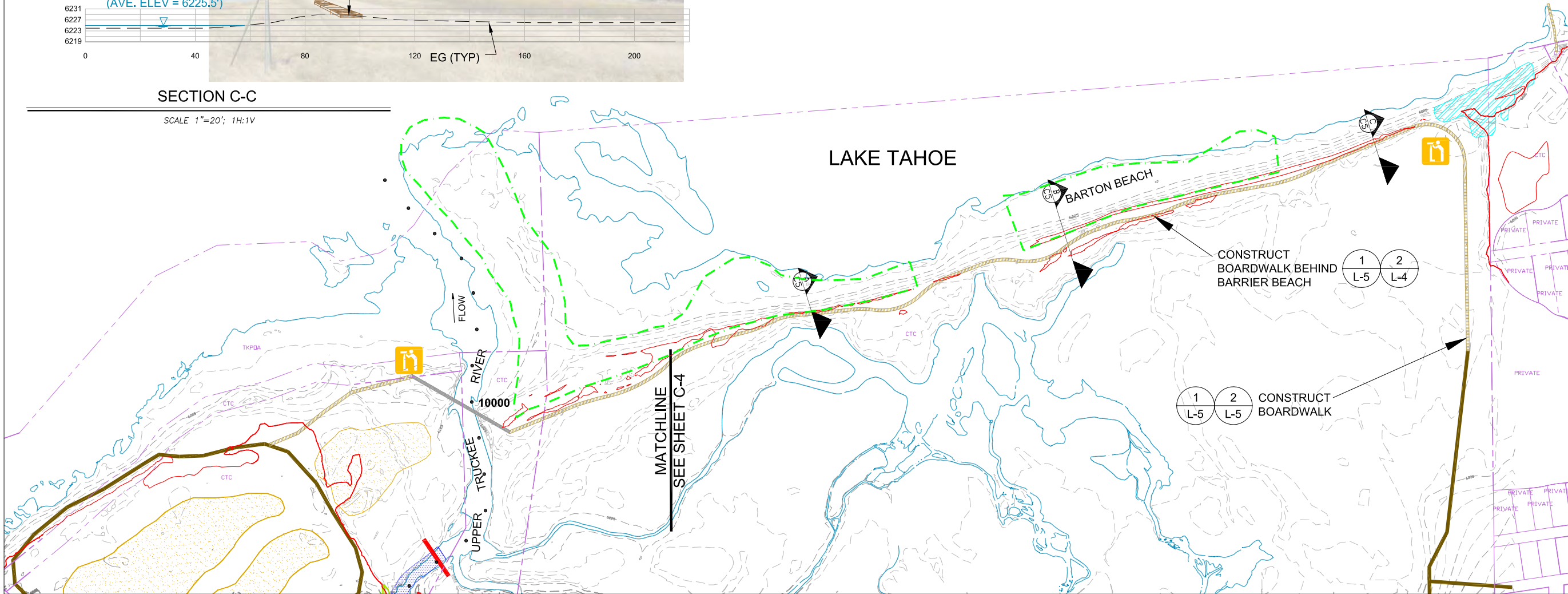
SECTION B-B

SCALE 1"=20'; 1H:1V



SECTION C-C

SCALE 1"=20'; 1H:1V



UPPER TRUCKEE RIVER
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PROJECT

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BARTON BEACH
BOARDWALK
(ALTERNATIVE 1)

C-5

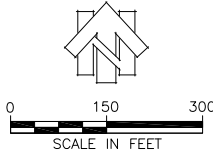
REVISIONS

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job no.: 00110066.04
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checked by: CM

sheet no.: C-5

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date: 11/20/07



- Existing 1000 ft. River Station
- Existing 100 ft. River Station - Upper Truckee
- Existing 100 ft. River Station - Trout Creek
- ■ ■ ■ Existing Regional Bike Trail

- Low and Bankful Flow Channel
-  Active Floodplain
-  Removal of Reserve Fill
-  Partial Fill of Existing Channel

-  Core Habitat Area
-  Lagoon
-  Restored Meadow
-  Restored Dune and Beach
-  Tahoe Yellow Cress Restricted Use Area

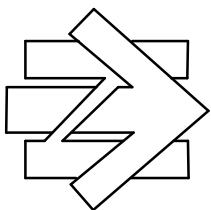
 Viewpoint $\frac{1}{L-3}$

 Pedestrian Trail $\frac{3}{L-2}$ or $\frac{2}{L-2}$

 Boardwalk $\frac{1}{L-5}$ or $\frac{4}{L-5}$

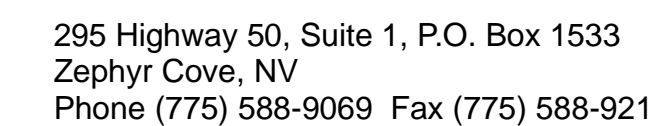
 Fishing Platform $\frac{1}{L-8}$
 ADA Accessible
 Kiosk $\frac{1}{L-10}$ or $\frac{4}{L-10}$

-  Lateral Grade Control
-  Vertical Grade Control
-  Bulkhead/Levee
-  Bank Protection
-  Storm Water Treatment Area



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ALTERNATIVE 2

**NEW CHANNEL
WEST MEADOW
MINIMUM RECREATION
INFRASTRUCTURE**

S-2

scale :	As Noted
job no. :	00110066.04
drawn by :	EL
checked by :	CM

sheet no. : S-2

sheet 10 of 45
date : 11/07/12

UPPER TRUCKEE RIVER AND MARSH RESTORATION PROJECT

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UPSTREAM REACH PLAN
RS 0 - 3000
(ALTERNATIVE 2)

C-6

REVISIONS

#	description	date
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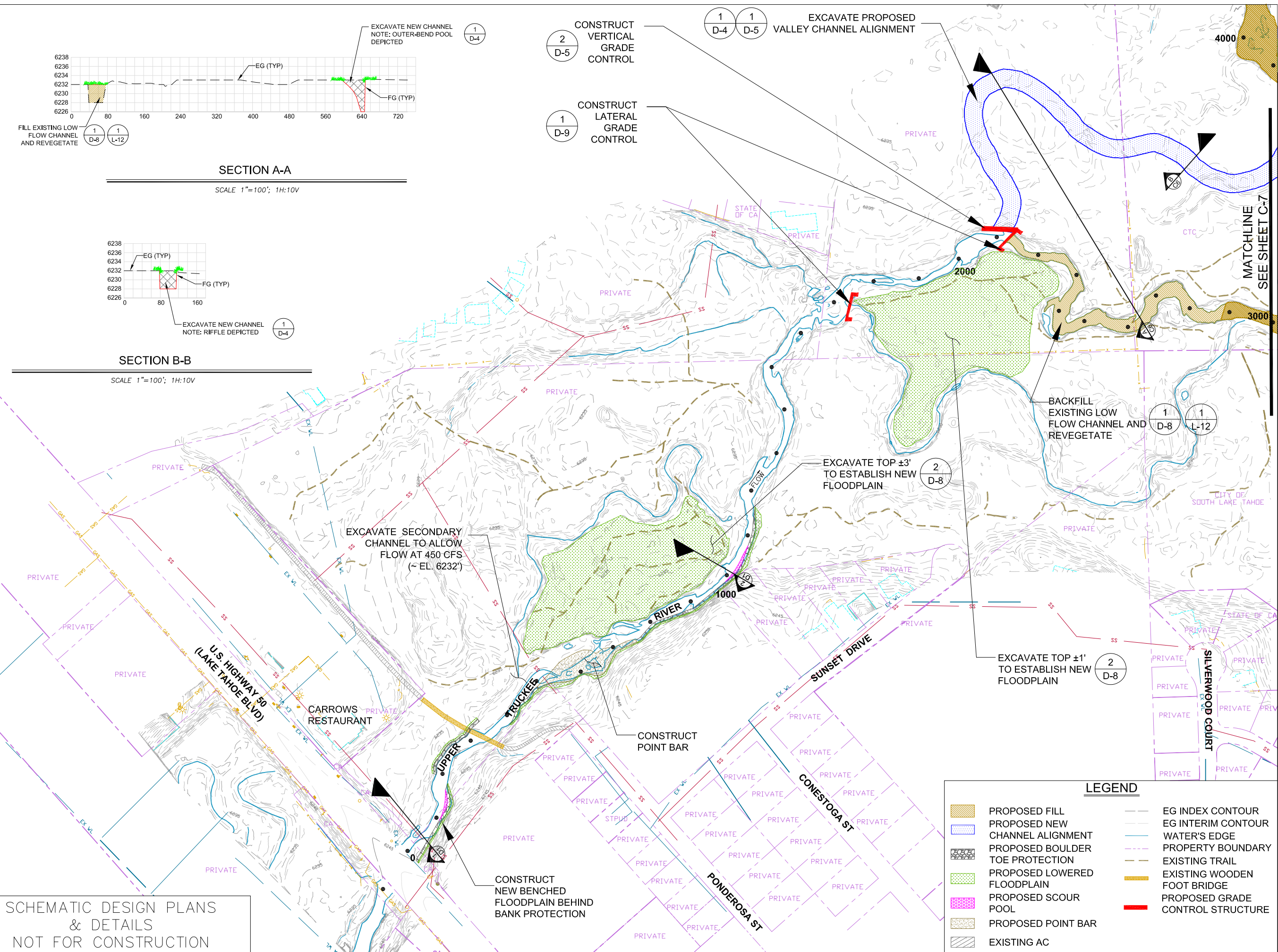
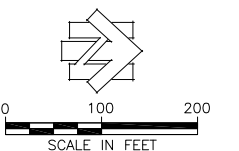
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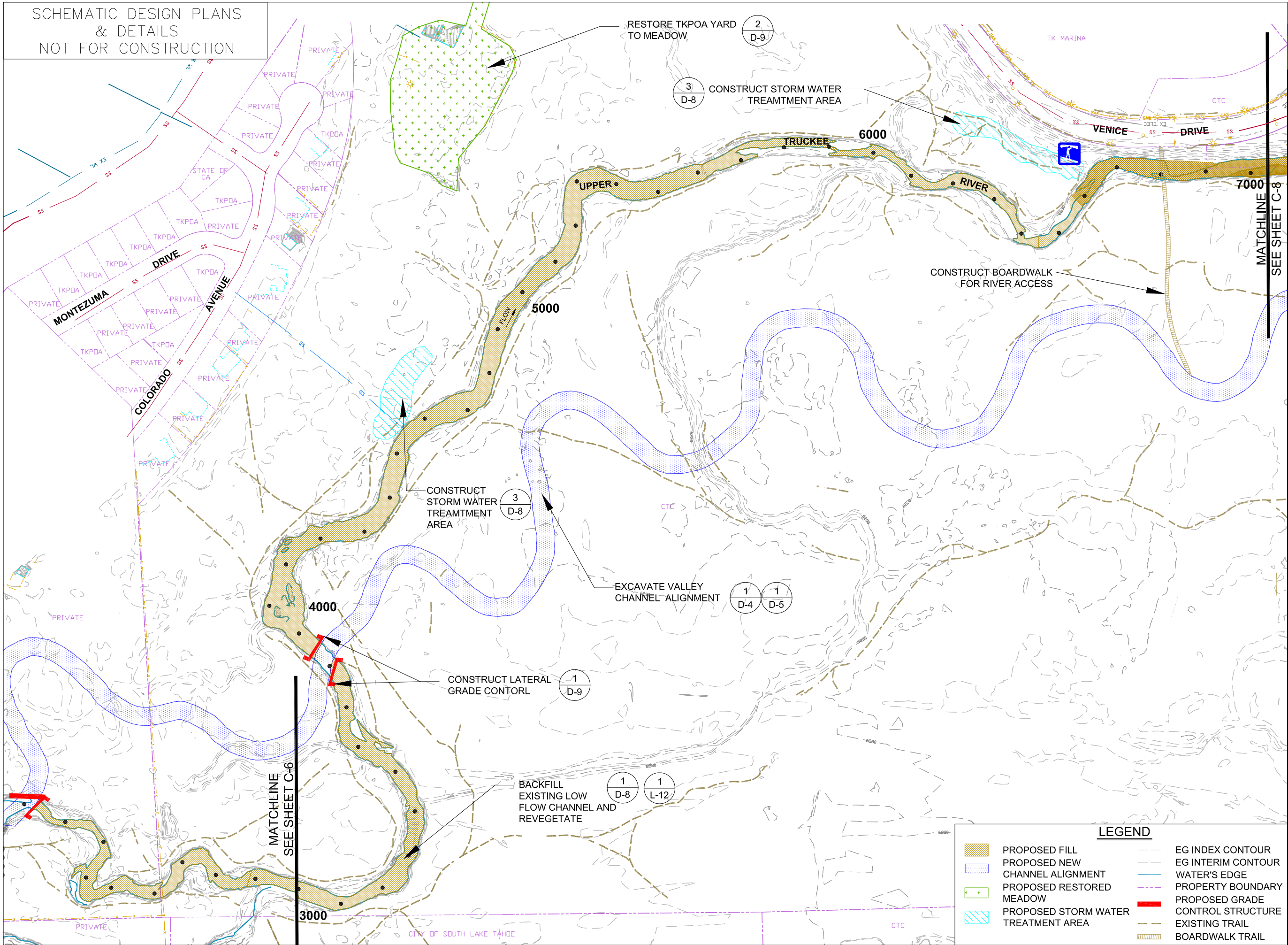
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sheet no.: C-6

sheet 11 of 45
date: 11/20/07



SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION



UPPER TRUCKEE RIVER
AND MARSH RESTORATION
PROJECT

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MID-MARSH
PLAN
RS 3000 - 7000
(ALTERNATIVE 2)

C-7

REVISIONS

#	description	date

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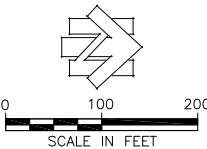
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sheet no.: C-7

sheet 12 of 45

date: 11/20/07



PROPOSED FILL

PROPOSED CHANNEL ALIGNMENT

PROPOSED RESTORED DUNE

PROPOSED TAHOE YELLOW CRESS RESTRICTED AREA

PROPOSED GRADE CONTROL STRUCTURE

EG INDEX CONTOUR

EG INTERIM CONTOUR

FG INDEX CONTOUR

FG INTERIM CONTOUR

WATER'S EDGE

PROPERTY BOUNDARY

2

L-2

PROPOSED PED TRAIL

EXISTING TRAIL

ADA ACCESSIBLE

PROPOSED FISHING PLATFORM

PROPOSED VIEWPOINT

PROPOSED KIOSK

1

L-8

1

L-8

1

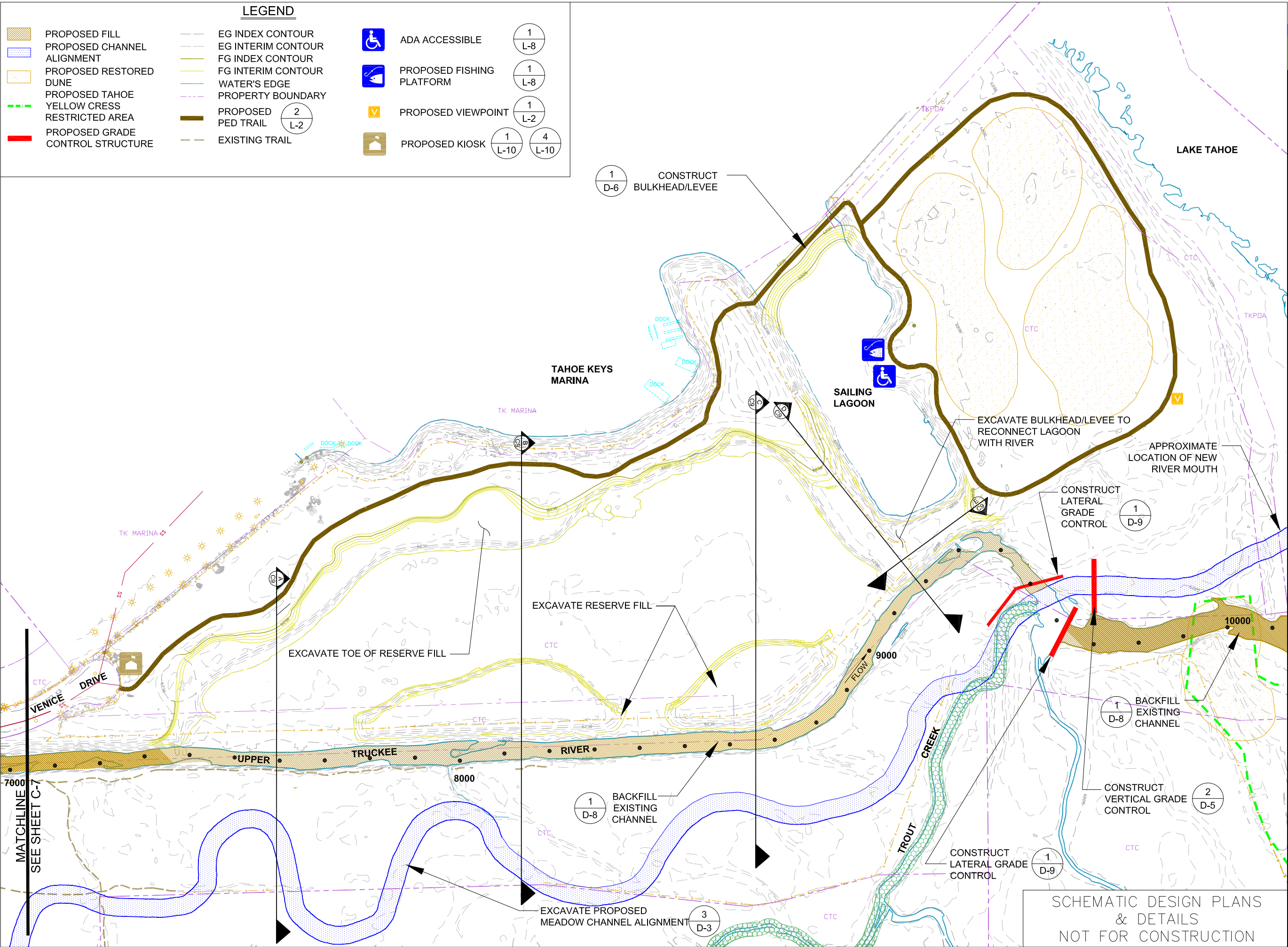
L-2

1

L-10

4

L-10



UPPER TRUCKEE RIVER
AND MARSH RESTORATION
PROJECT

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DOWNSTREAM REACH
PLAN
RS 7000 - 10100
(ALTERNATIVE 2)

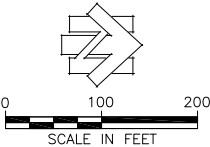
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REVISIONS		
#	description	date

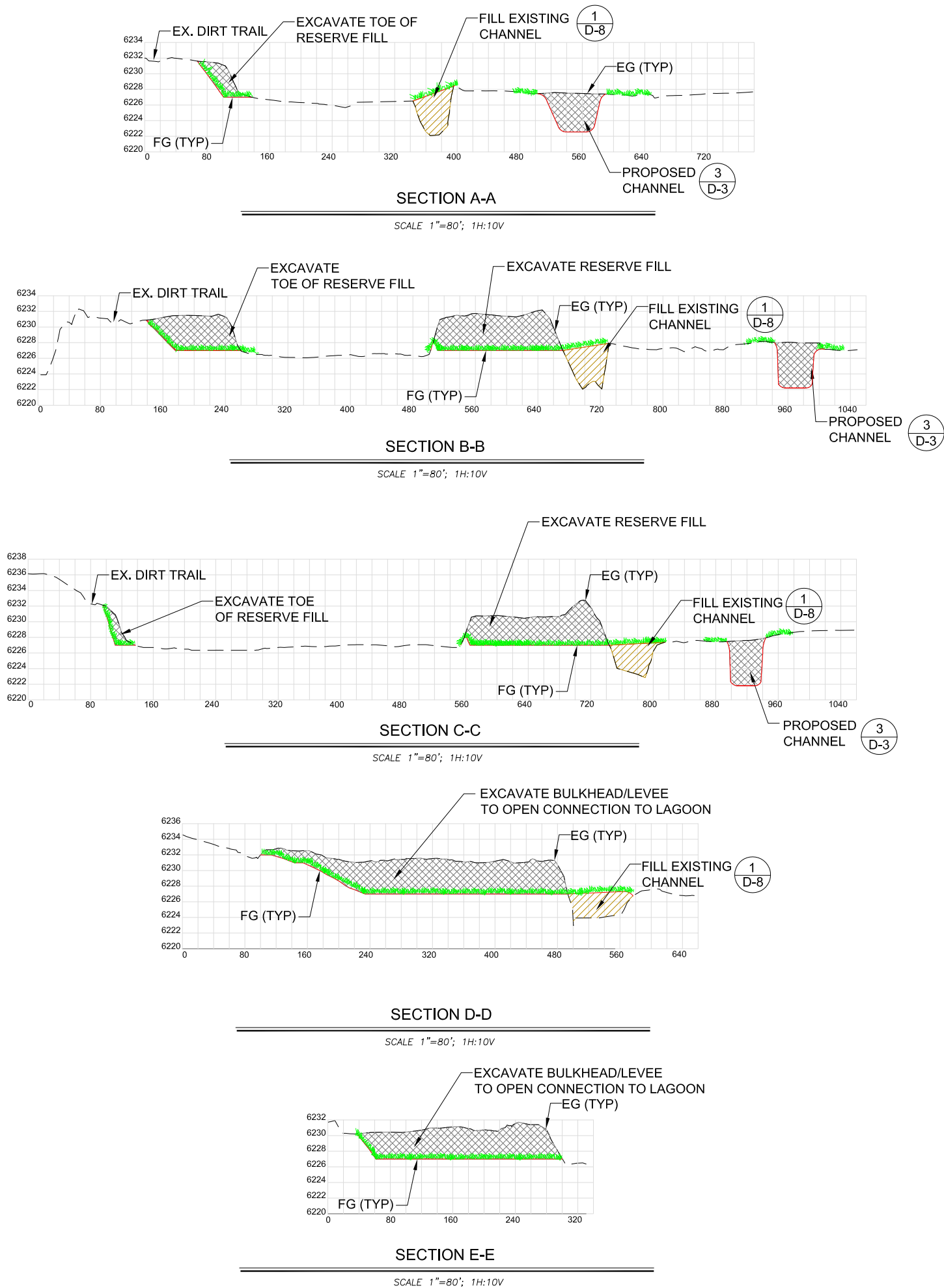
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drawn by:	CK
checked by:	CM

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date: 01/10/13



SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION



LEGEND

- PROPOSED CUT
- PROPOSED FILL
- PROPOSED REVEGETATION



UPPER TRUCKEE RIVER
AND MARSH RESTORATION
PROJECT

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DOWNSTREAM REACH
RS 7000 - 10700
CROSS SECTIONS
(ALTERNATIVE 2)

C-9

REVISIONS		
#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	CK
checked by:	CM

sheet no.: C-9

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date: 01/10/13



Legend

Existing 1000 ft. River Station

Existing 100 ft. River Station - Upper Truckee

Existing 100 ft. River Station - Trout Creek

Existing Regional Bike Trail

Proposed Habitat Features
(See Sheet L-12)

Core Habitat Area

Lagoon

Restored Meadow

Tahoe Yellow Cress Restricted Use Area

Proposed River and Floodplain Features

Low and Bankful Flow Channel

Potential Low Flow Path

Active Floodplain

Removal of Reserve Fill

Partial Fill of Existing Channel

Proposed Engineered Features

Lateral Grade Control

Vertical Grade Control

Bulkhead/Levee

Bank Protection

Storm Water Treatment Area

Overbank Conveyance Bridge Modification

Channel Grade Control and Bank Protection

Proposed Public Access Features

Viewpoint

Boardwalk

Bike Path

Pedestrian Trail

Fishing Platform

ADA Accessible

Observation Area

Kiosk

The map displays the Middle Marsh Corridor with various features and elevations. Key areas include the Tahoe Keys Marina, Cove East Beach, Barton Beach, and the Lower West Side Restoration Area. The map is divided into sheets C-10, C-11, C-12, and C-13. Elevation markers range from 0 to 10000 feet. The map also shows the Tahoe Island Subdivision, Highland Woods Subdivision, and Al Tahoe Subdivision. Key roads include U.S. Highway 50 / Lake Tahoe Boulevard, Springwood Drive, Macinaw Road, El Dorado Avenue, Capistrano Avenue, Placer Avenue, Stanford Avenue, Los Angeles Avenue, San Francisco Avenue, Lily Avenue, and Lakeview Avenue. The map includes a scale bar from 0 to 800 feet and a north arrow.

DGS

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UPPER TRUCKEE RIVER
AND MARSH
RESTORATION PROJECT

E.I.P. #560

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ALTERNATIVE 3

MIDDLE MARSH CORRIDOR
MODERATE RECREATION
INFRASTRUCTURE

S-3

REVISIONS

#	description	date

scale :

As Noted

job no. :

00110066.04

drawn by :

EL

checked by :

CM

sheet no. : S-3

sheet

15

of

45

date :

11/07/12

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UPSTREAM REACH
PLAN
RS 0 - 3000
(ALTERNATIVE 3)

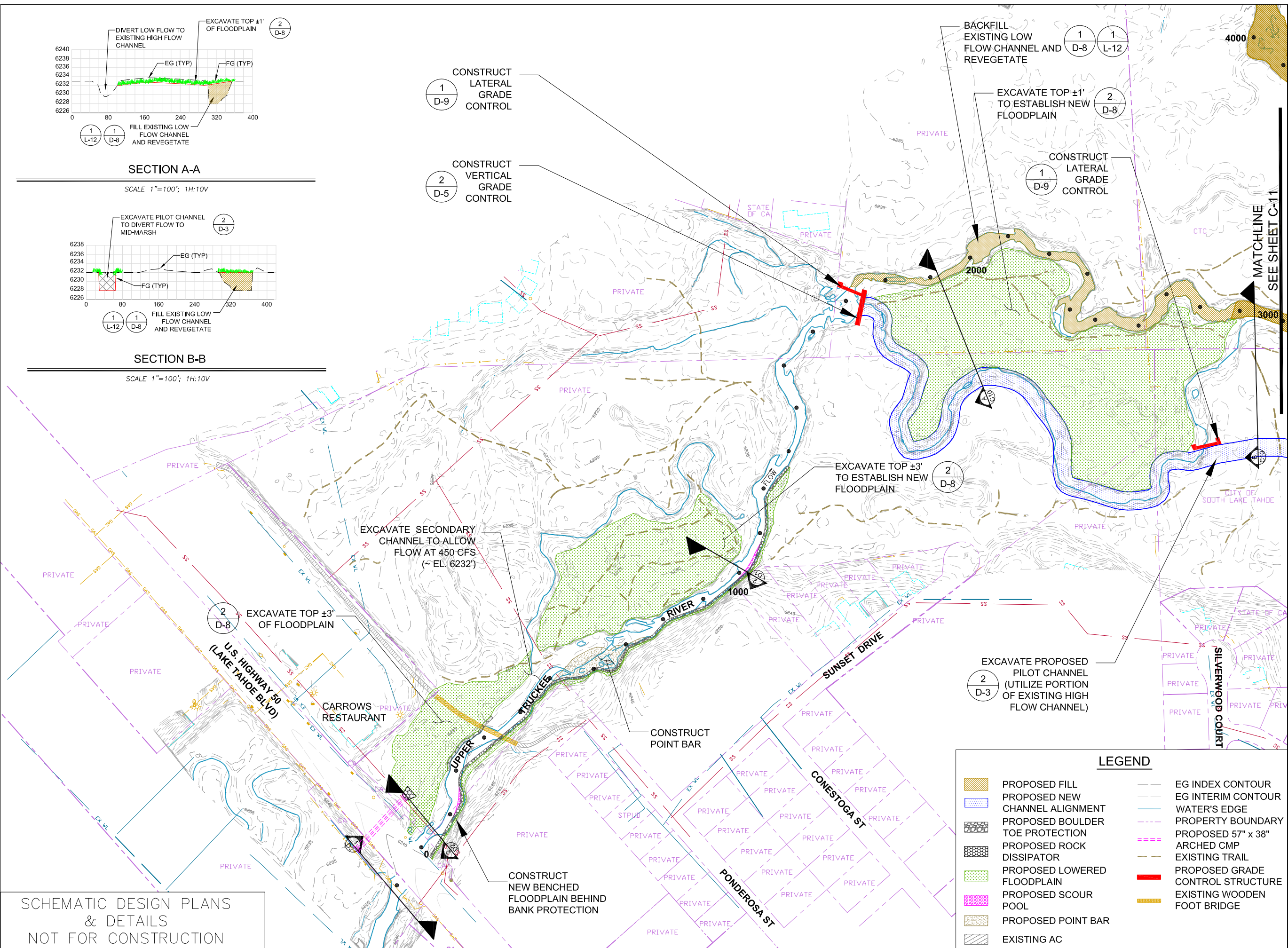
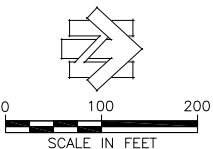
C-10

REVISIONS
description date

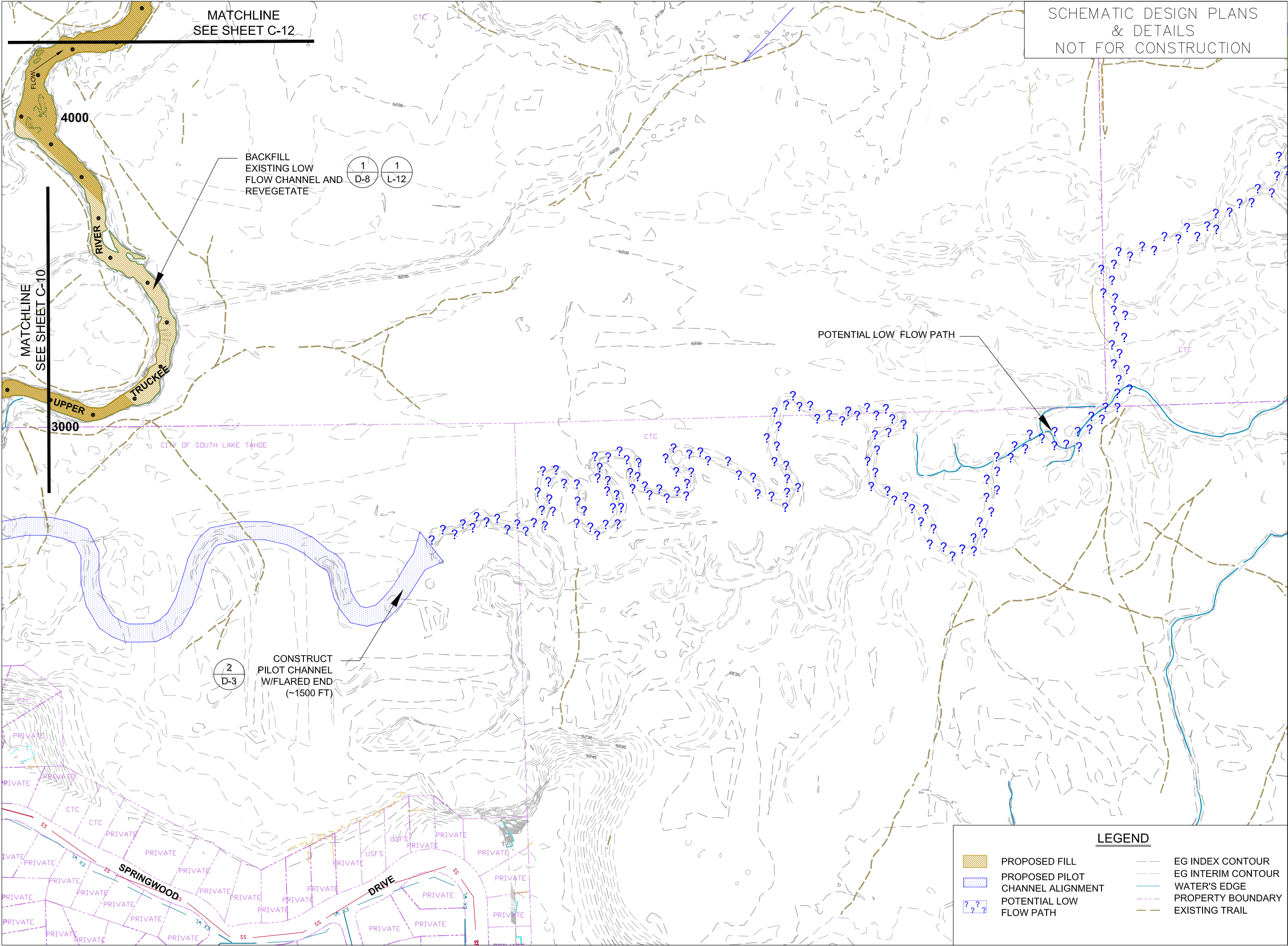
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drawn by: CK
checked by: CM

sheet no.: C-10

sheet 16 of 45
date: 11/20/07



SCHEMATIC DESIGN PLANS
& DETAILS
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MID-MARSH
PLAN
SHEET A
RS 3000 - 7000
(ALTERNATIVE 3)

C-11

REVISIONS

#	description	date

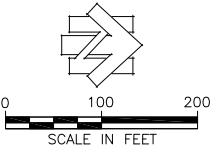
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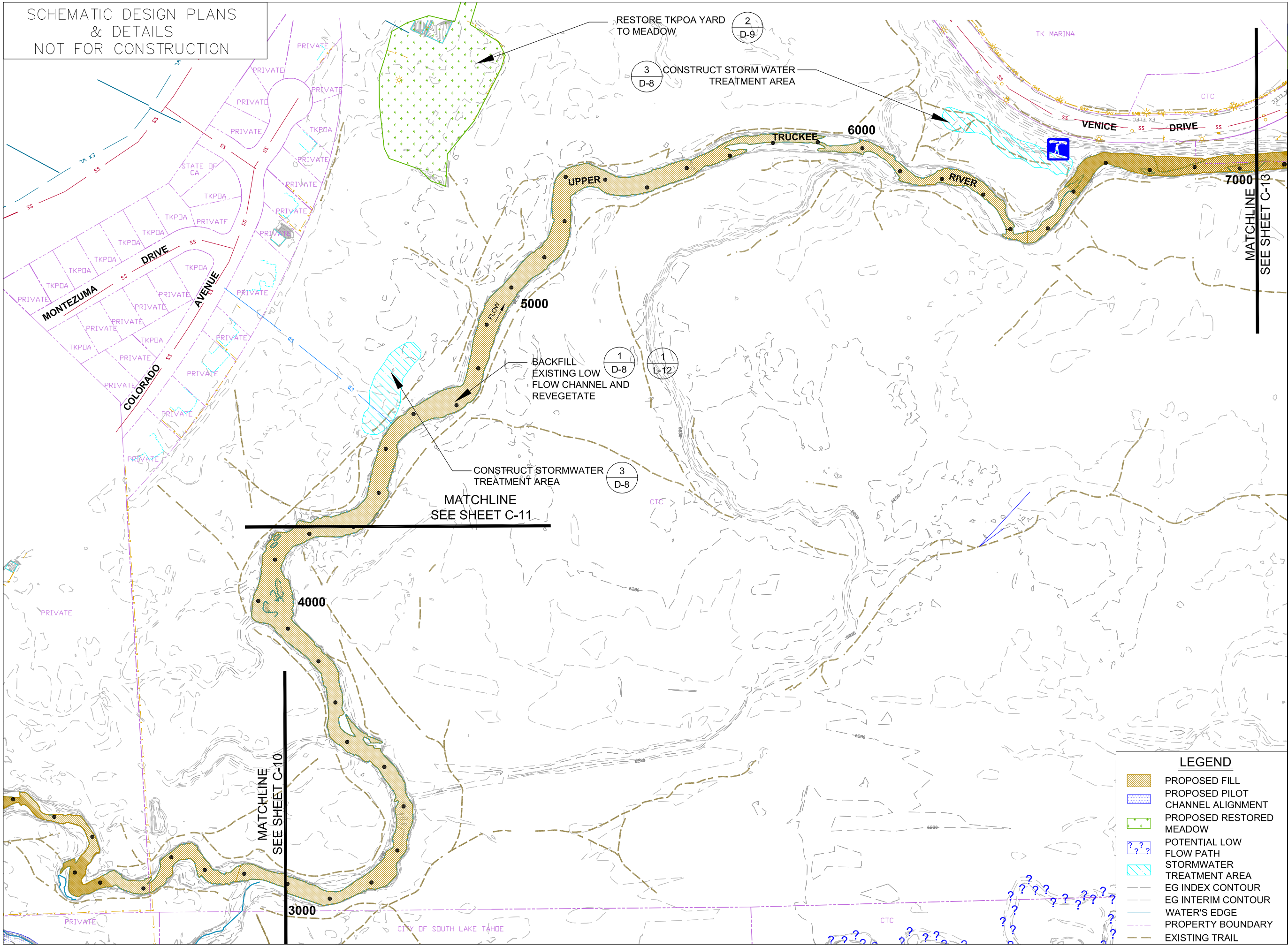
sheet 17 of 45
date: 11/20/07

LEGEND

	PROPOSED FILL		EG INDEX CONTOUR
	PROPOSED PILOT CHANNEL ALIGNMENT		EG INTERIM CONTOUR
	POTENTIAL LOW FLOW PATH		WATER'S EDGE
			PROPERTY BOUNDARY
			EXISTING TRAIL



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MID-MARSH
PLAN
SHEET B
RS 3000 - 7000
(ALTERNATIVE 3)

C-12

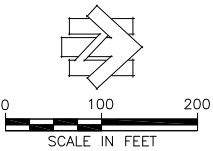
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checked by:	CM

sheet no.: C-12

sheet 18 of 45
date: 11/20/07

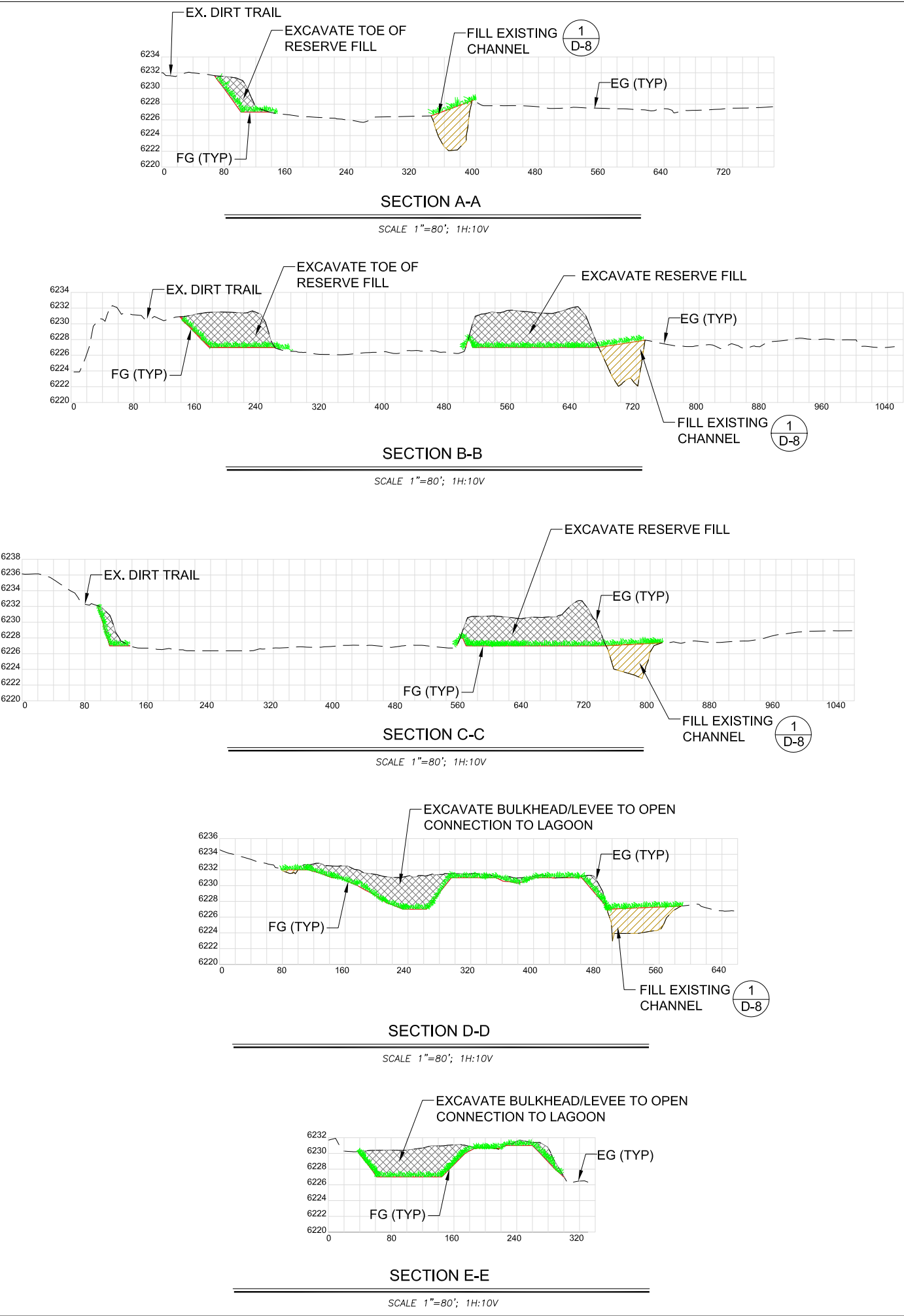


LEGEND

- PROPOSED FILL
- PROPOSED PILOT CHANNEL ALIGNMENT
- PROPOSED RESTORED MEADOW
- POTENTIAL LOW FLOW PATH
- STORMWATER TREATMENT AREA
- EG INDEX CONTOUR
- EG INTERIM CONTOUR
- WATER'S EDGE
- PROPERTY BOUNDARY
- EXISTING TRAIL

SCHEMATIC DESIGN PLANS
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SCHEMATIC DESIGN PLANS
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LEGEND

- PROPOSED CUT
- PROPOSED FILL
- PROPOSED REVEGETATION



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DOWNSTREAM REACH
RS 7000 - 10700
CROSS SECTIONS
(ALTERNATIVE 3)

C-14

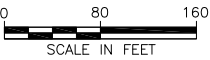
REVISIONS

#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	CK
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sheet no.: C-14

sheet 20 of 45
date: 11/20/07



Legend

1000 ft. River Station

100 ft. River Station - Upper Truckee

100 ft. River Station - Trout Creek

Existing Regional Bike Trail

Proposed Habitat Features
(See Sheet L-12)

Core Habitat Area

Tahoe Yellow Cress Restricted Use Area

Proposed River and Floodplain Features

Low and Bankful Flow Channel

Active Floodplain

Area of Inset Floodplain

Removal of Reserve Fill

Partial Fill of Existing Channel

Proposed Engineered Features

Bank Protection

Proposed Public Access Features

Viewpoint

Observation Area

Boardwalk

Bike Path

Pedestrian Trail

Kiosk

2
L-3

2
L-7

or

1
L-6

2
L-5

2
L-1

2
L-2

or

3
L-2

2
L-10

or

5
L-10

0400800

Feet

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ALTERNATIVE 4

INSET FLOODPLAIN
MODERATE RECREATION
INFRASTRUCTURE

S-4

REVISIONS

#

description

date

scale :

As Noted

job no. :

00110066.04

drawn by :

EL

checked by :

CM

sheet no. : S-4

sheet

21

of

45

date :

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UPSTREAM REACH
PLAN
RS 0 - 3000
(ALTERNATIVE 4)

C-15

REVISIONS

#	description	date
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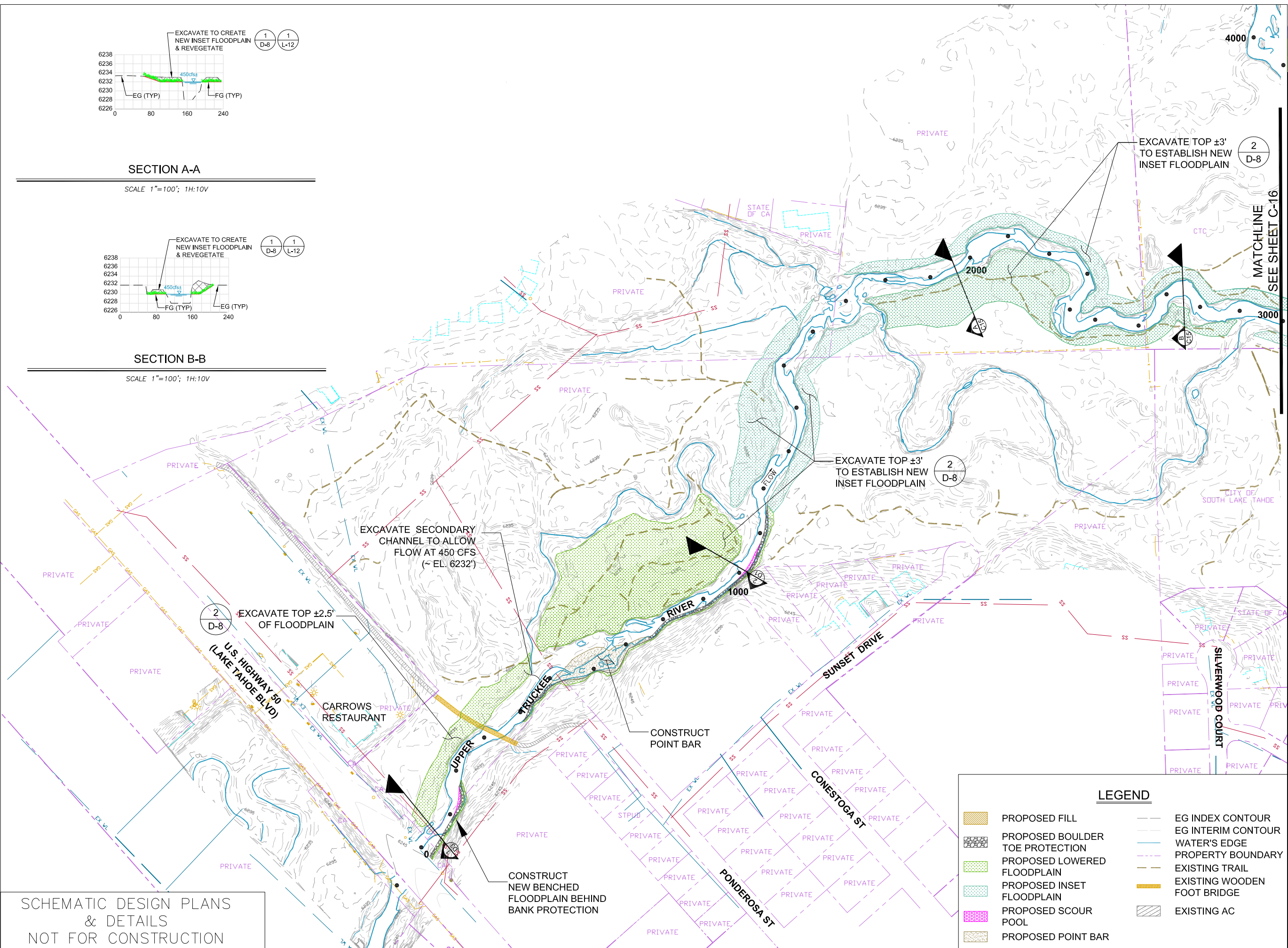
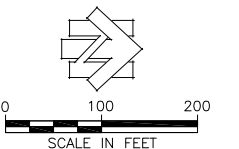
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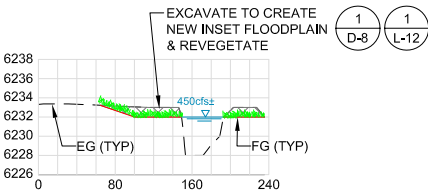
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sheet 22 of 45
date: 11/20/07



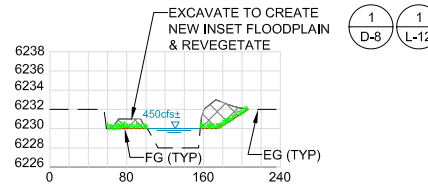
SECTION A-A

SCALE 1"=100'; 1H:10V



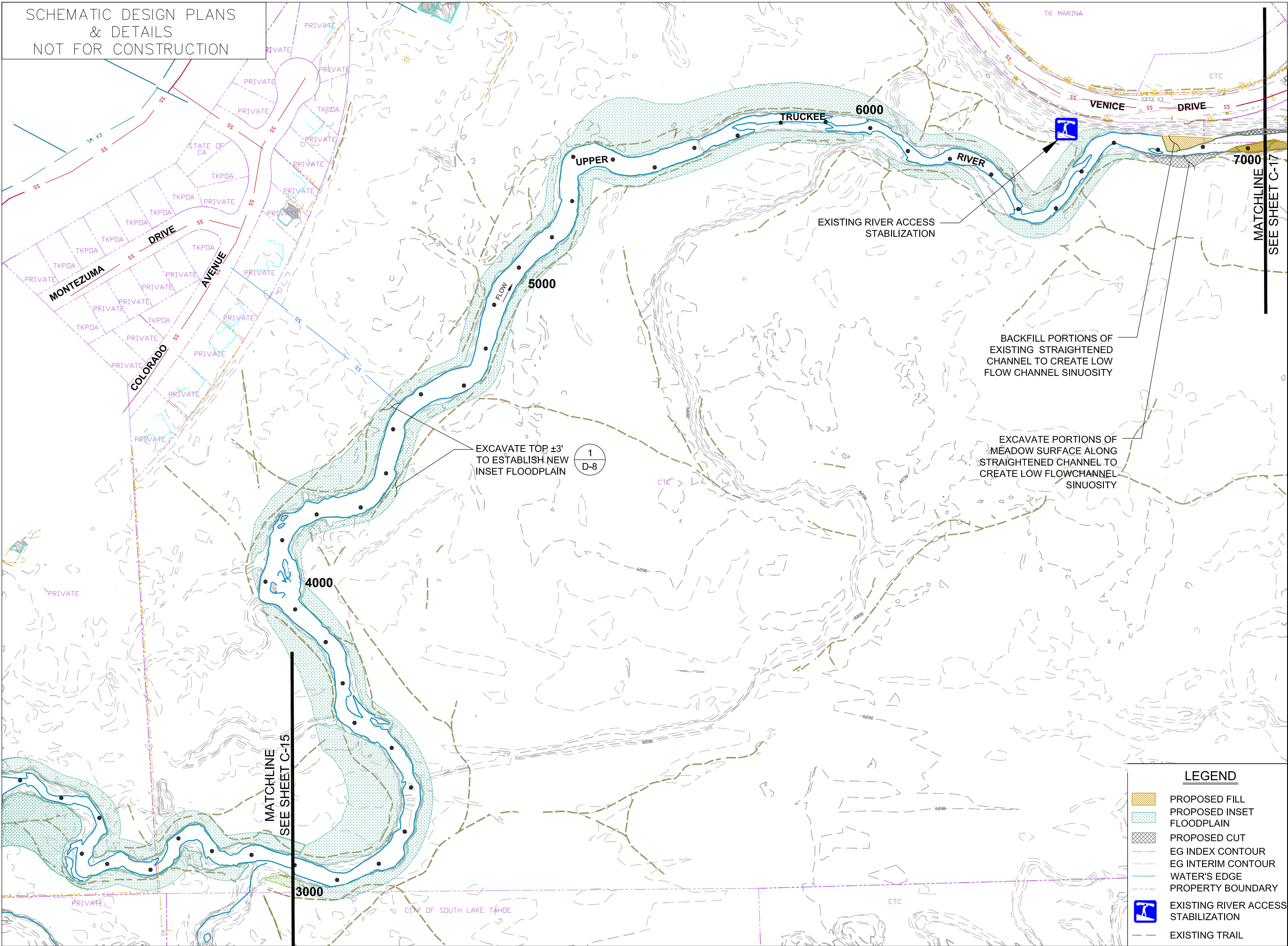
SECTION B-B

SCALE 1"=100'; 1H:10V



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MID-MARSH
PLAN
RS 3000 - 7000
(ALTERNATIVE 4)

C-16

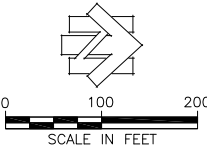
REVISIONS

#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	CK
checked by:	CM

sheet no.: C-16

sheet 23 of 45
date: 10/19/07



LEGEND

- PROPOSED FILL
- PROPOSED INSET FLOODPLAIN
- PROPOSED CUT
- EG INDEX CONTOUR
- EG INTERIM CONTOUR
- WATER'S EDGE
- PROPERTY BOUNDARY
- EXISTING RIVER ACCESS STABILIZATION
- EXISTING TRAIL





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DOWNSTREAM REACH
RS 7000 - 10700
CROSS SECTIONS
(ALTERNATIVE 4)

C-18

REVISIONS

#	description	date

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job no.: 00110066.04

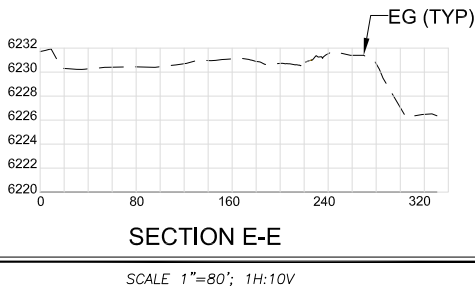
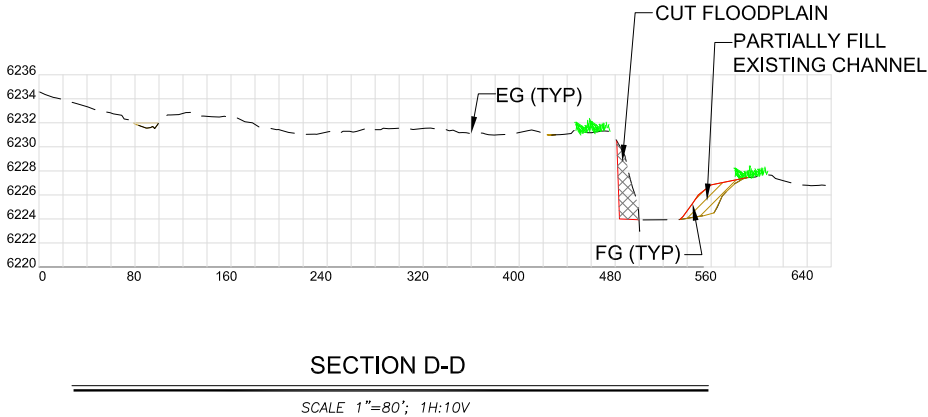
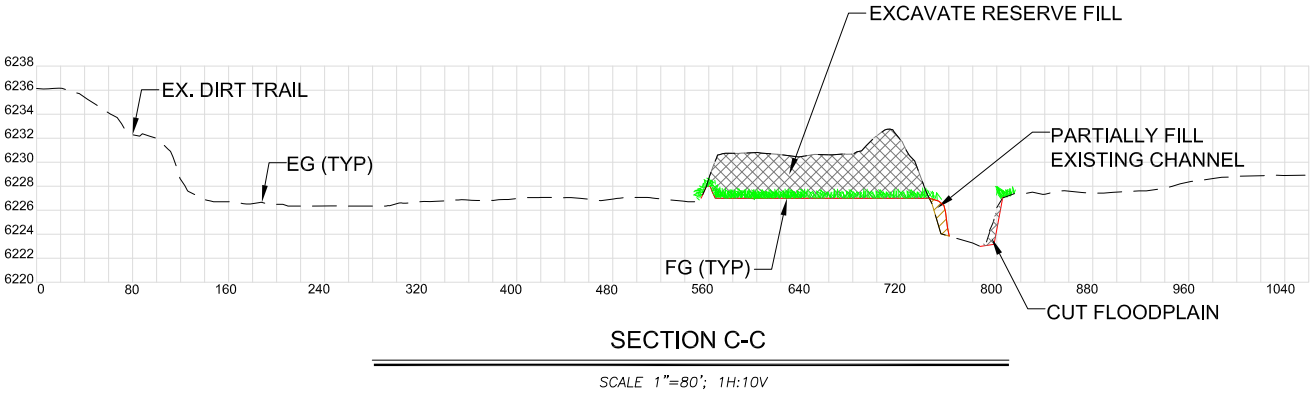
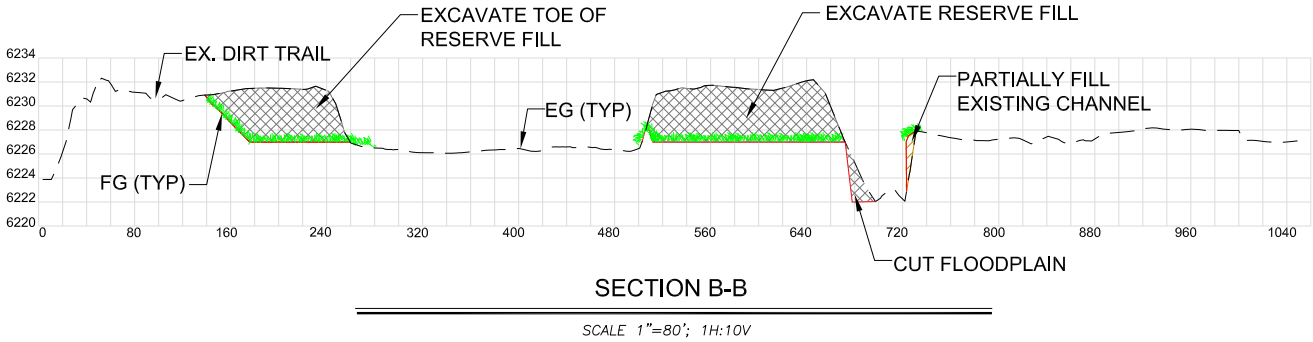
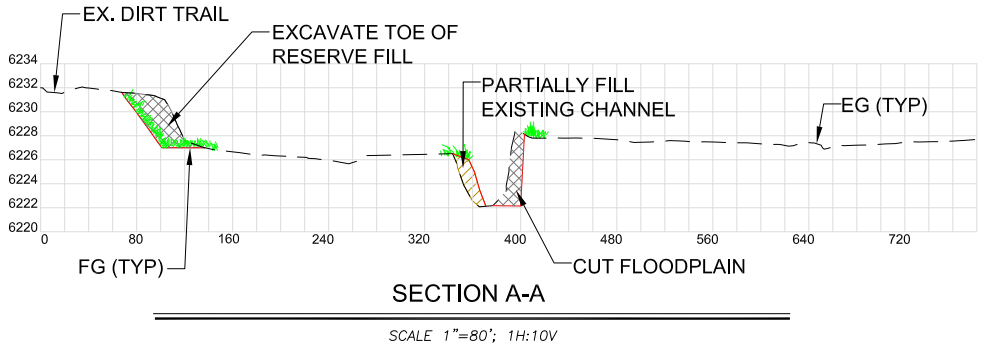
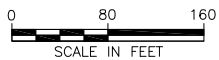
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sheet no.: C-18

sheet 25 of 45

date: 11/20/07



- LEGEND
- PROPOSED CUT
 - PROPOSED FILL
 - PROPOSED REVEGETATION

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UPPER TRUCKEE RIVER
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DETAILS

D-1

REVISIONS

#	description	date

scale: AS SHOWN

job no.: 00110066.04

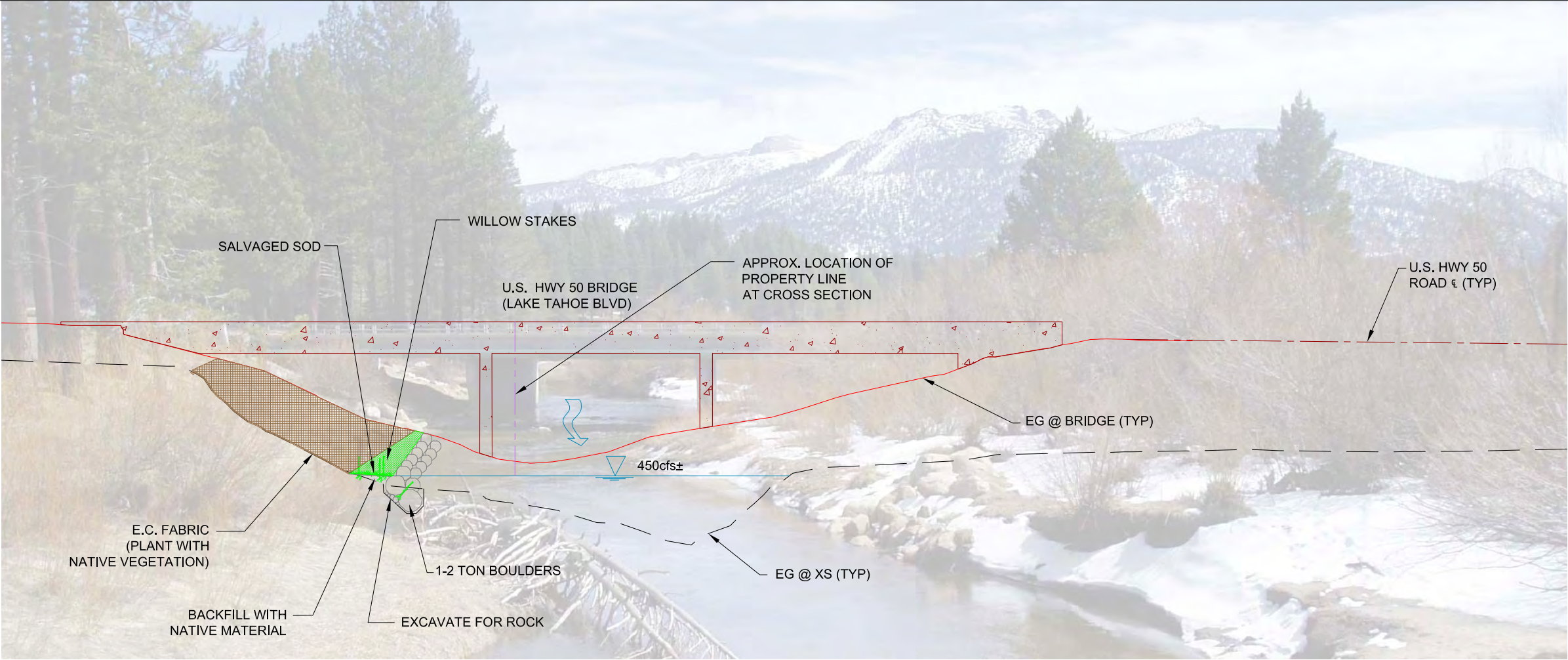
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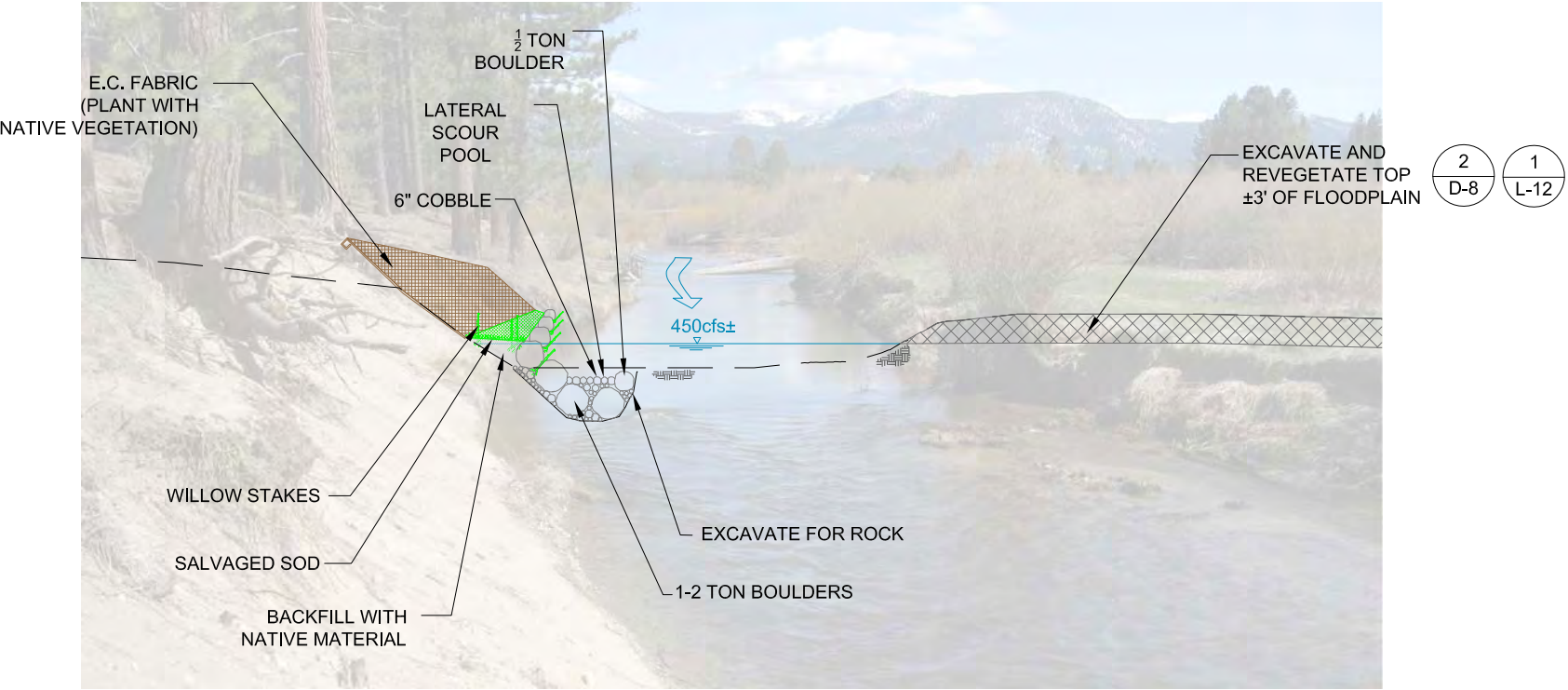
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sheet 26 of 45

date: 11/20/07



1
D-1
BANK STABILIZATION
(TYP. ALTERNATIVES 1&2)
N.T.S.



2
D-1
BANK STABILIZATION OUTSIDE BEND
(TYP. ALL ALTERNATIVES)
N.T.S.

SCHEMATIC DESIGN PLANS
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DETAILS

D-2

REVISIONS

#	description	date

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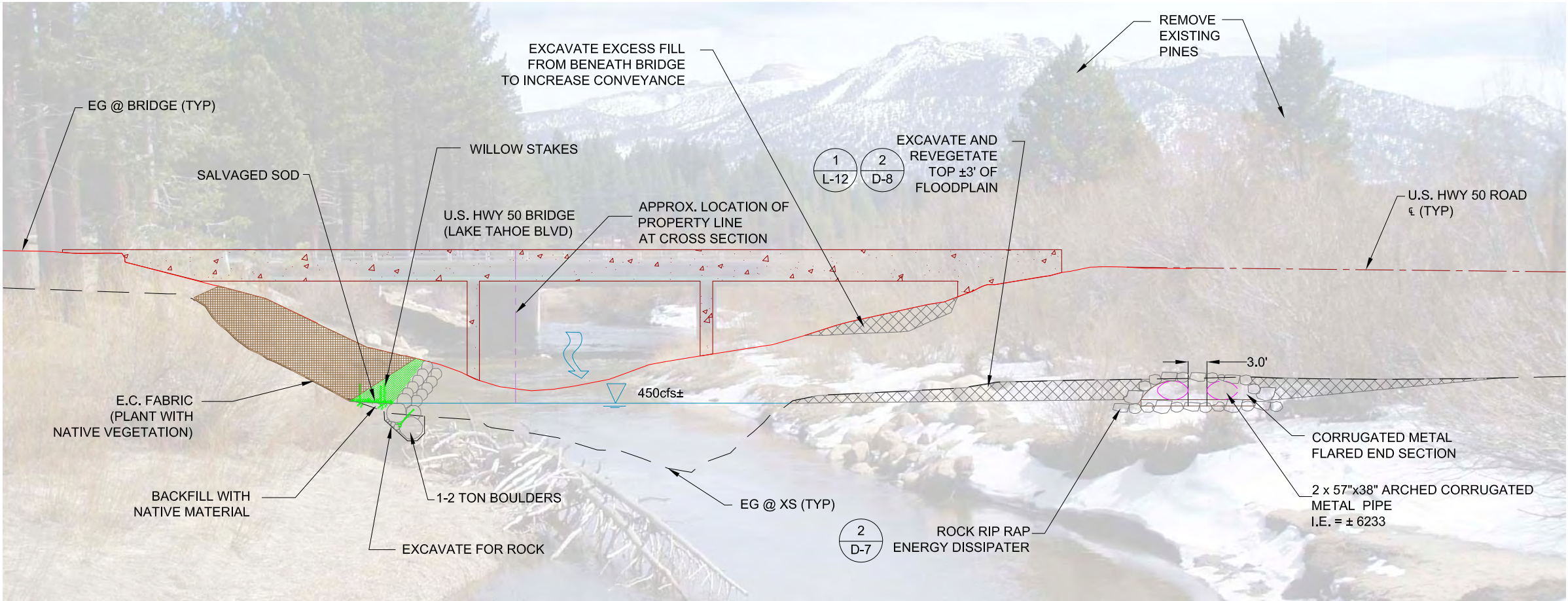
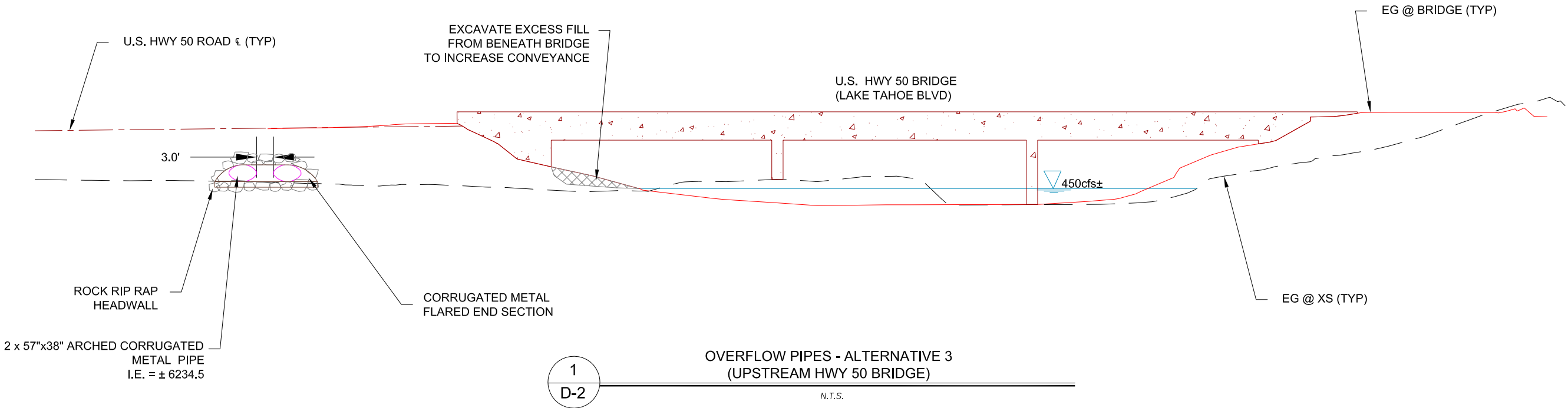
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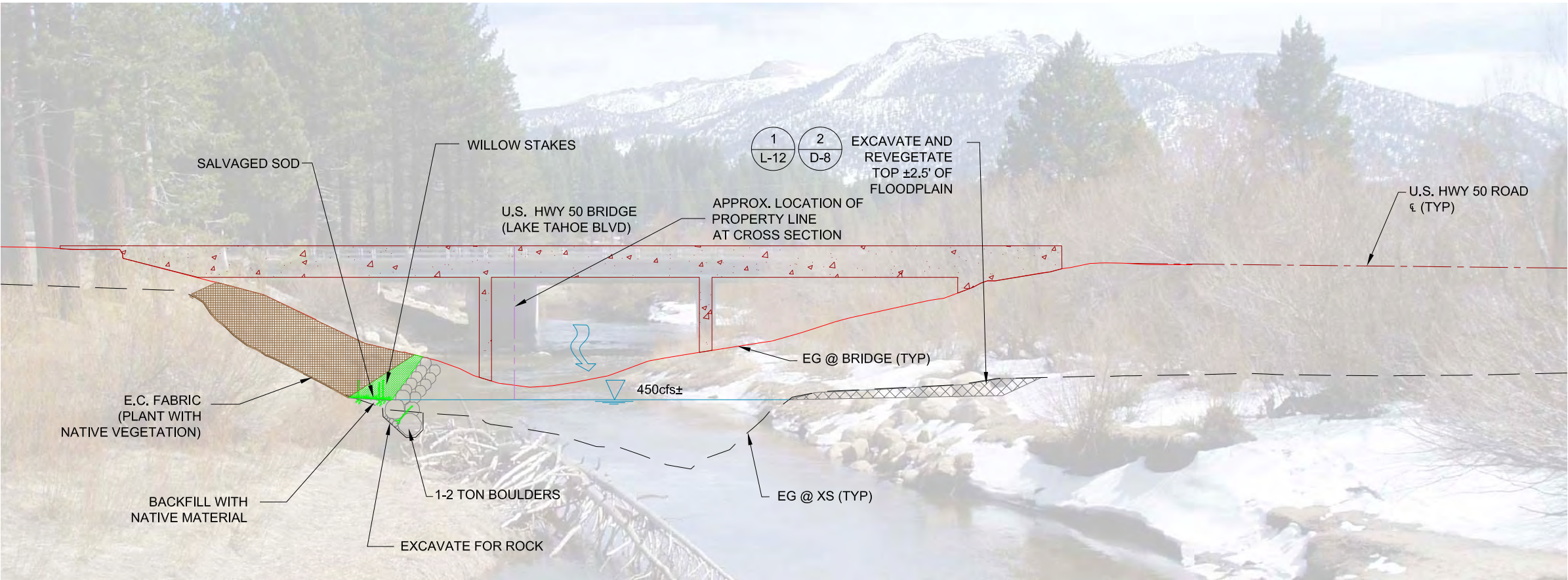
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sheet 27 of 45

date: 11/20/07



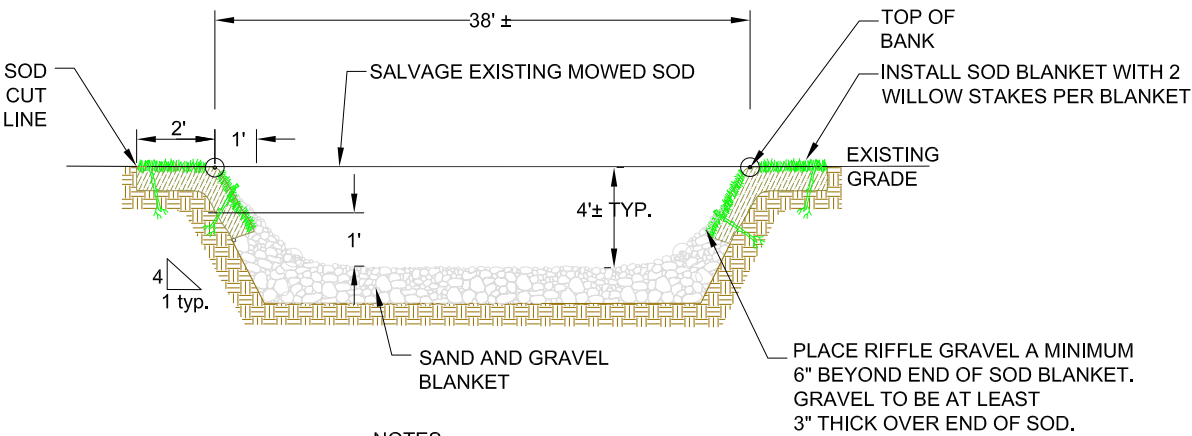
SCHEMATIC DESIGN PLANS
& DETAILS
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1
D-3

BANK PROTECTION - TYP. ALTERNATIVE 4

SCALE 1"=10'



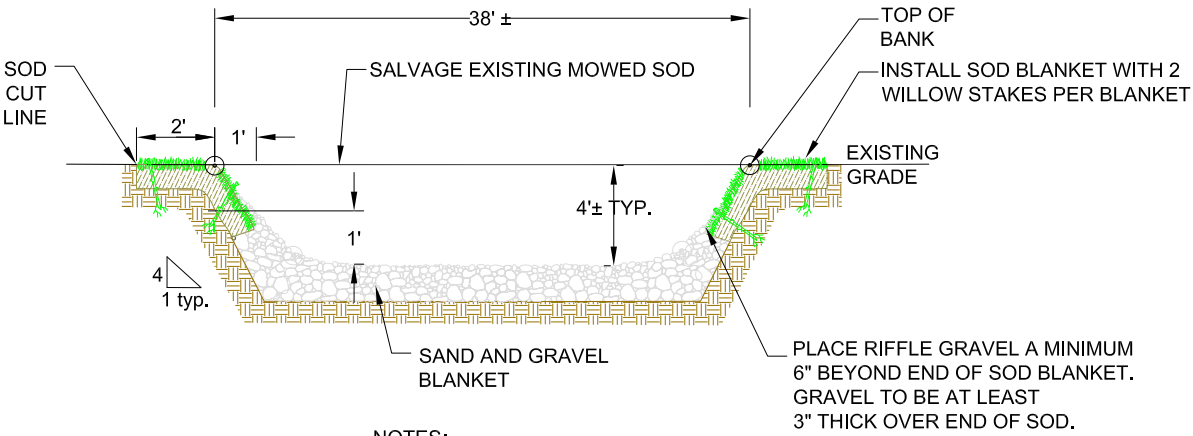
NOTES:

1. TOP OF BANK LINE SHALL BE PAINTED PRIOR TO GRADING, BY THE ENGINEER.

2
D-3

PILOT CHANNEL TYP. CROSS-SECTION - ALTERNATIVE 3

NTS



NOTES:

1. TOP OF BANK LINE SHALL BE PAINTED PRIOR TO GRADING, BY THE ENGINEER.

3
D-3

MEADOW REACH TYPICAL CROSS -SECTION - ALTS 1, 2, & 4

NTS

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DETAILS

D-3

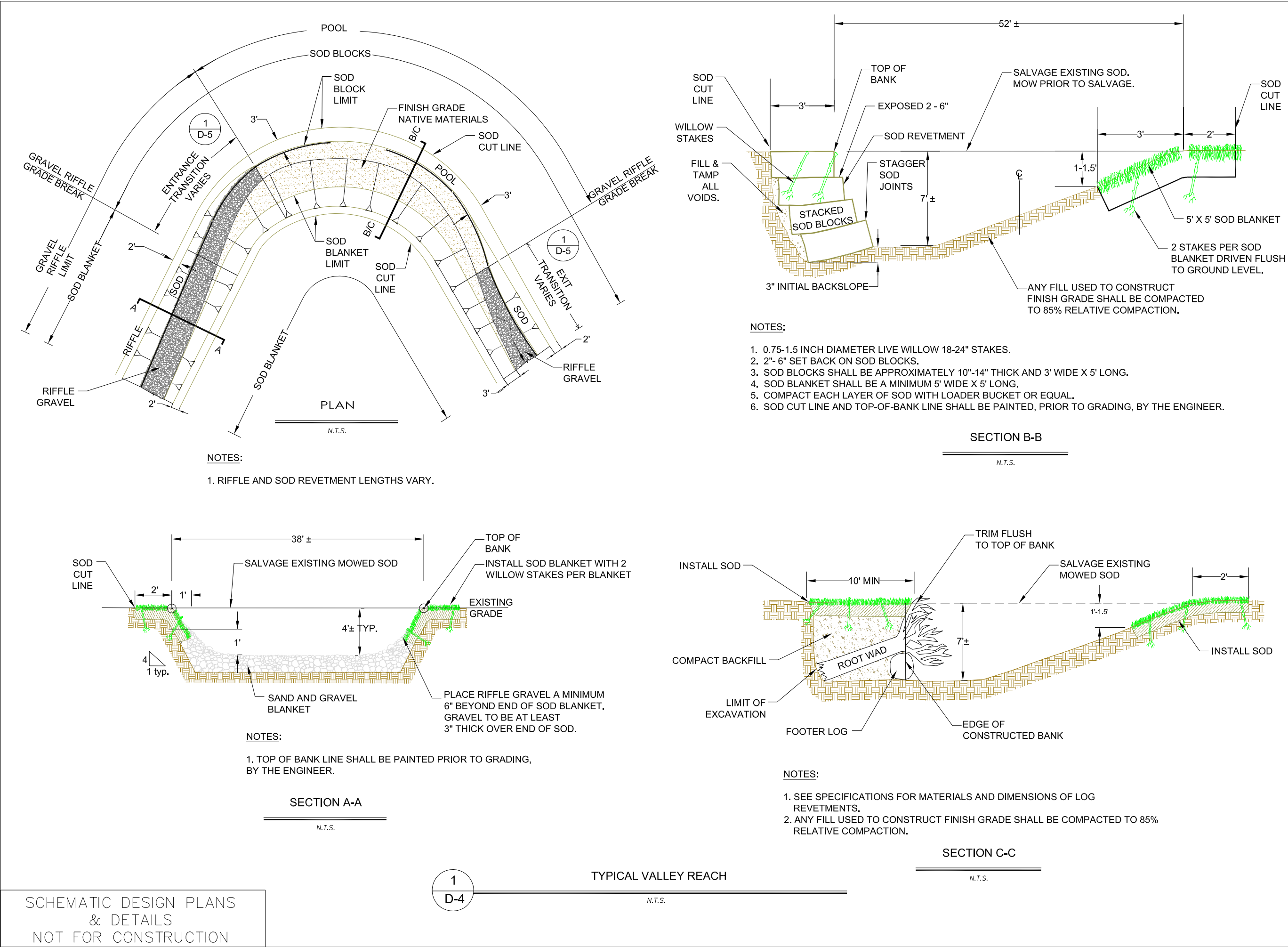
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#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	CK
checked by:	CM

sheet no.: D-3

sheet 28 of 45
date: 11/20/07



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DETAILS

D-4

REVISIONS

#	description	date

scale: AS SHOWN

job no.: 00110066.04

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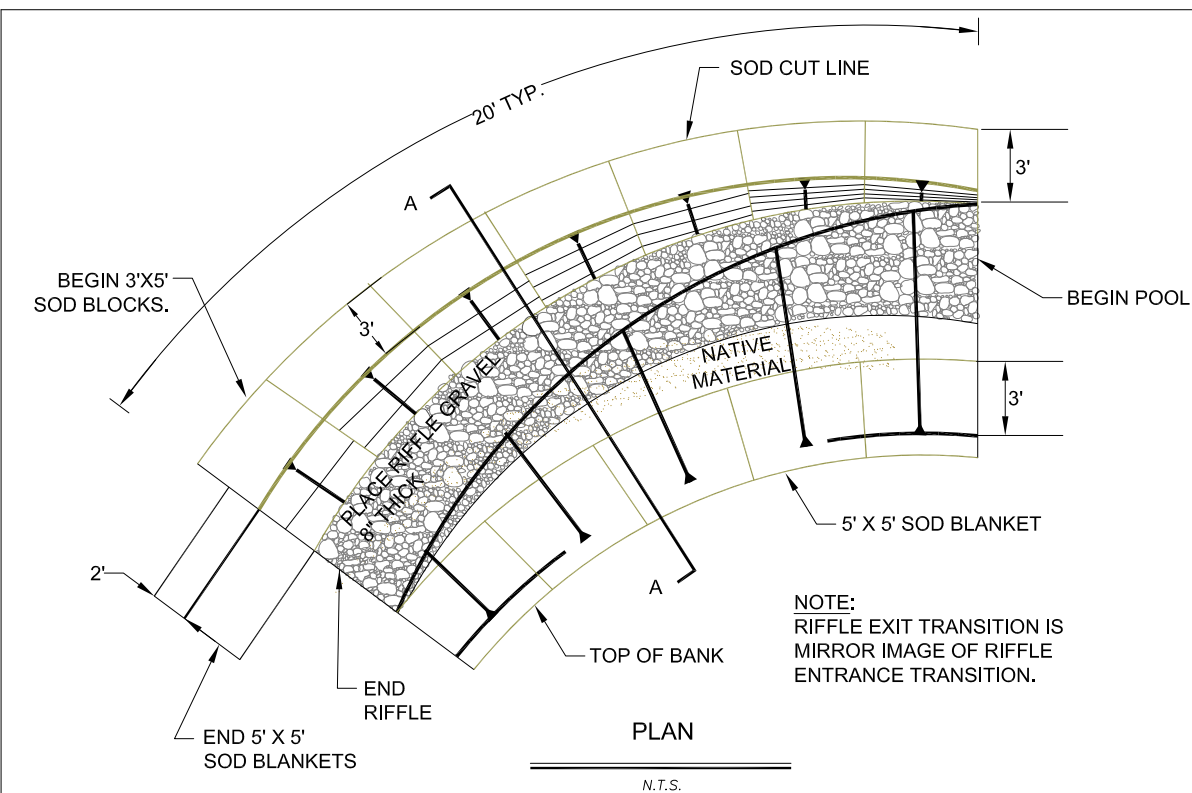
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sheet 29 of 45

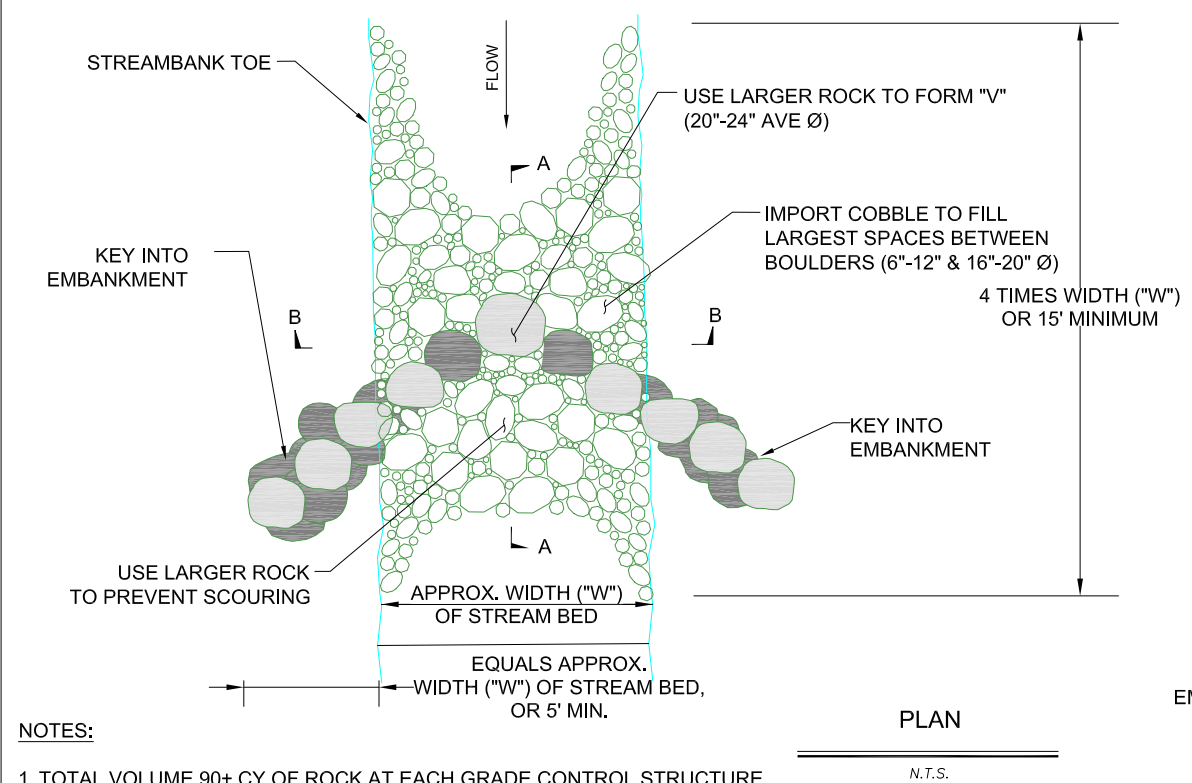
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1 TYPICAL NEW CHANNEL TRANSITION

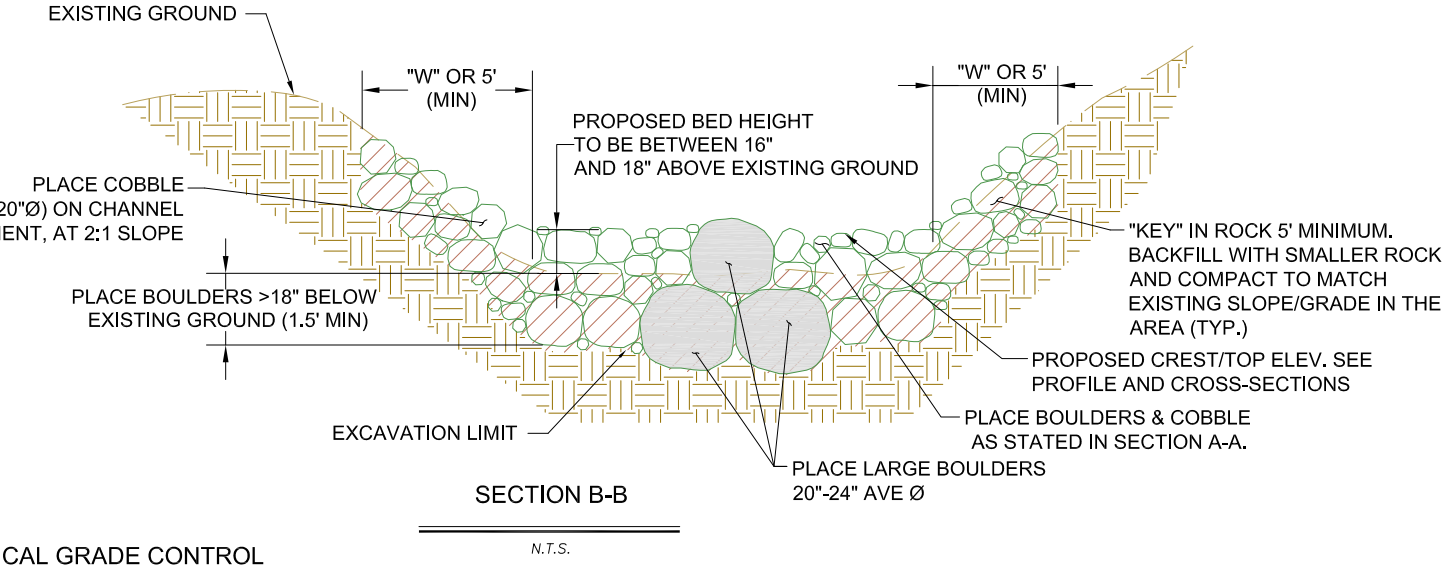
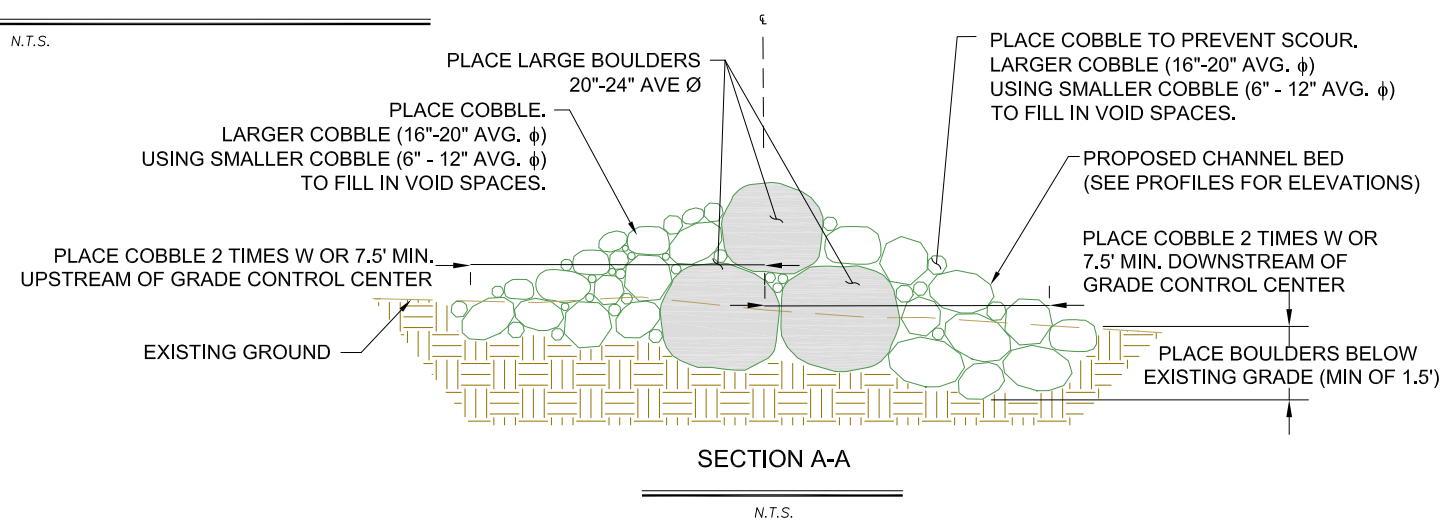
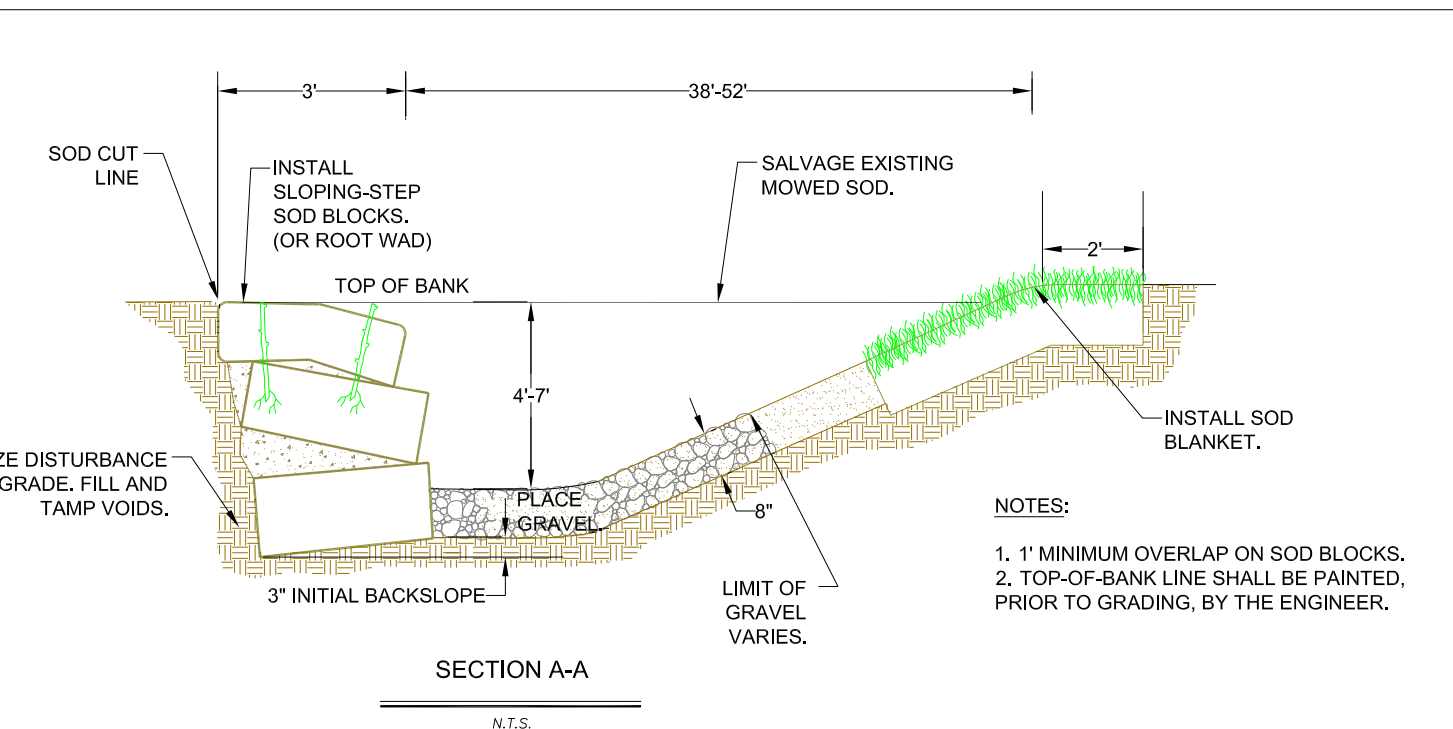
1
D-5



2 BOULDER VERTICAL GRADE CONTROL

2
D-5

- NOTES:
1. TOTAL VOLUME 90± CY OF ROCK AT EACH GRADE CONTROL STRUCTURE
 2. LARGE BOULDERS (20"-24" AVE Ø) PLACED TO FROM "V" IN GRADE CONTROL STRUCTURE SHALL BE PLACED (VERTICAL/ELEVATION) STARTING AT ϵ OF CHANNEL 16"-18" BELOW EXISTING GROUND.
 3. THE ELEVATION OF THE LARGE BOULDERS (20"-24" AVE Ø) SHALL INCREASE AT 2% ± GOING AWAY FROM THE CHANNEL ϵ AND INTO THE EMBANKMENT. THE BOTTOM OF THE ROCK IN THE CHANNEL ϵ SHALL BE APPROXIMATELY 0.25' LOWER THAN THE LAST ROCK PLACED (FURTHEST INTO EMBANKMENT).



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DETAILS

D-5

REVISIONS		
#	description	date

scale:	AS SHOWN
job no.:	00110066.04
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sheet no.: D-5

sheet 30 of 45
date: 11/20/07

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DETAILS

D-6

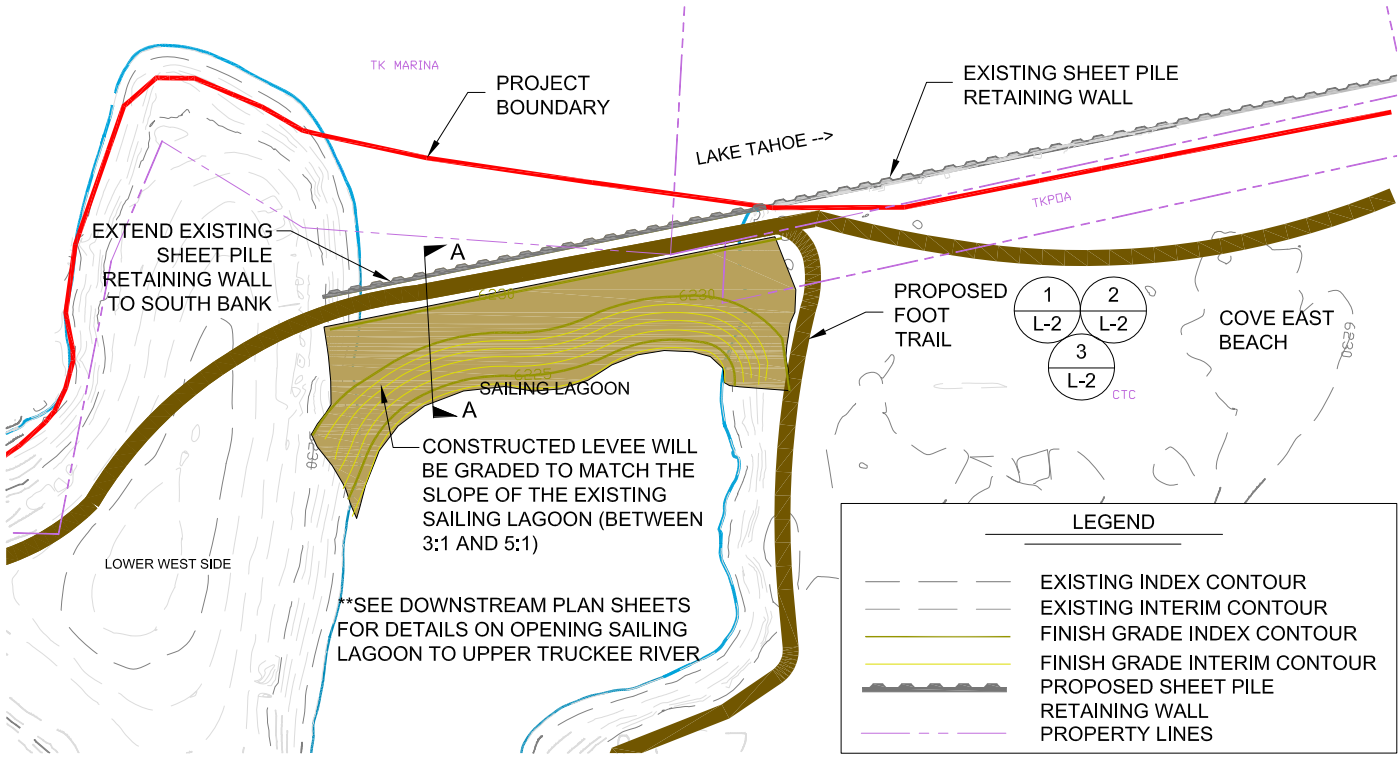
REVISIONS

#	description	date

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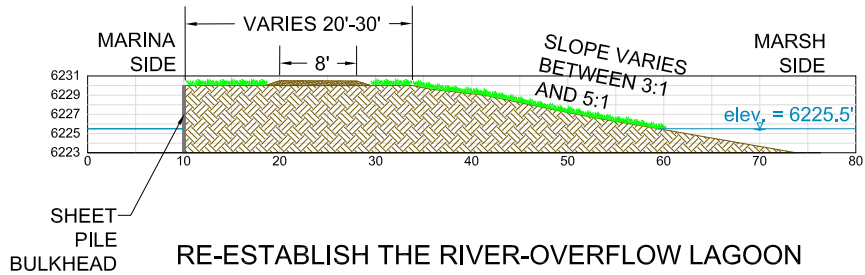
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sheet 31 of 45
date: 11/20/07



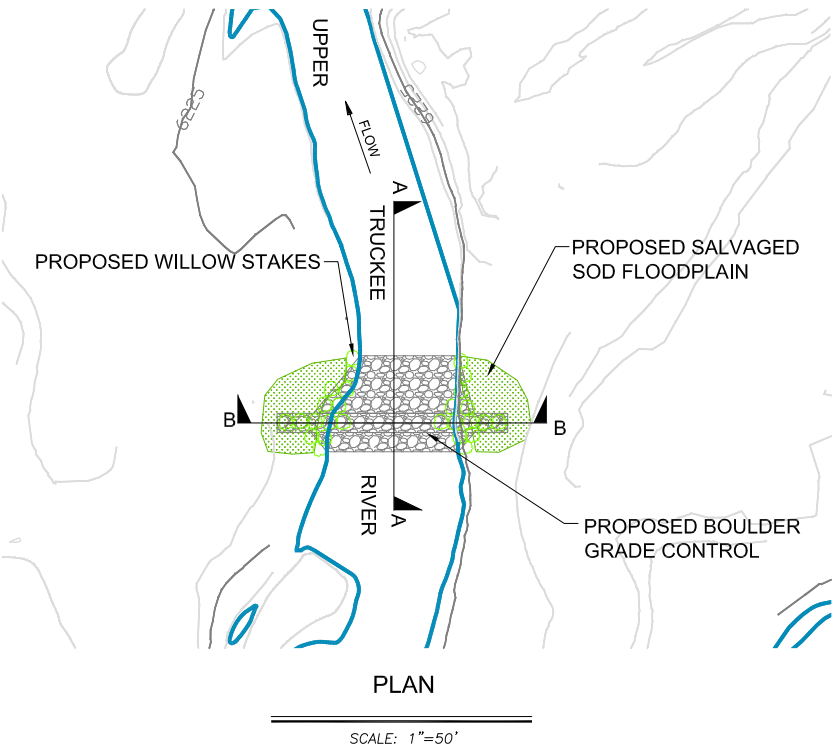
1
D-6

SAILING LAGOON BULKHEAD - ALTS. 1, 2, & 3



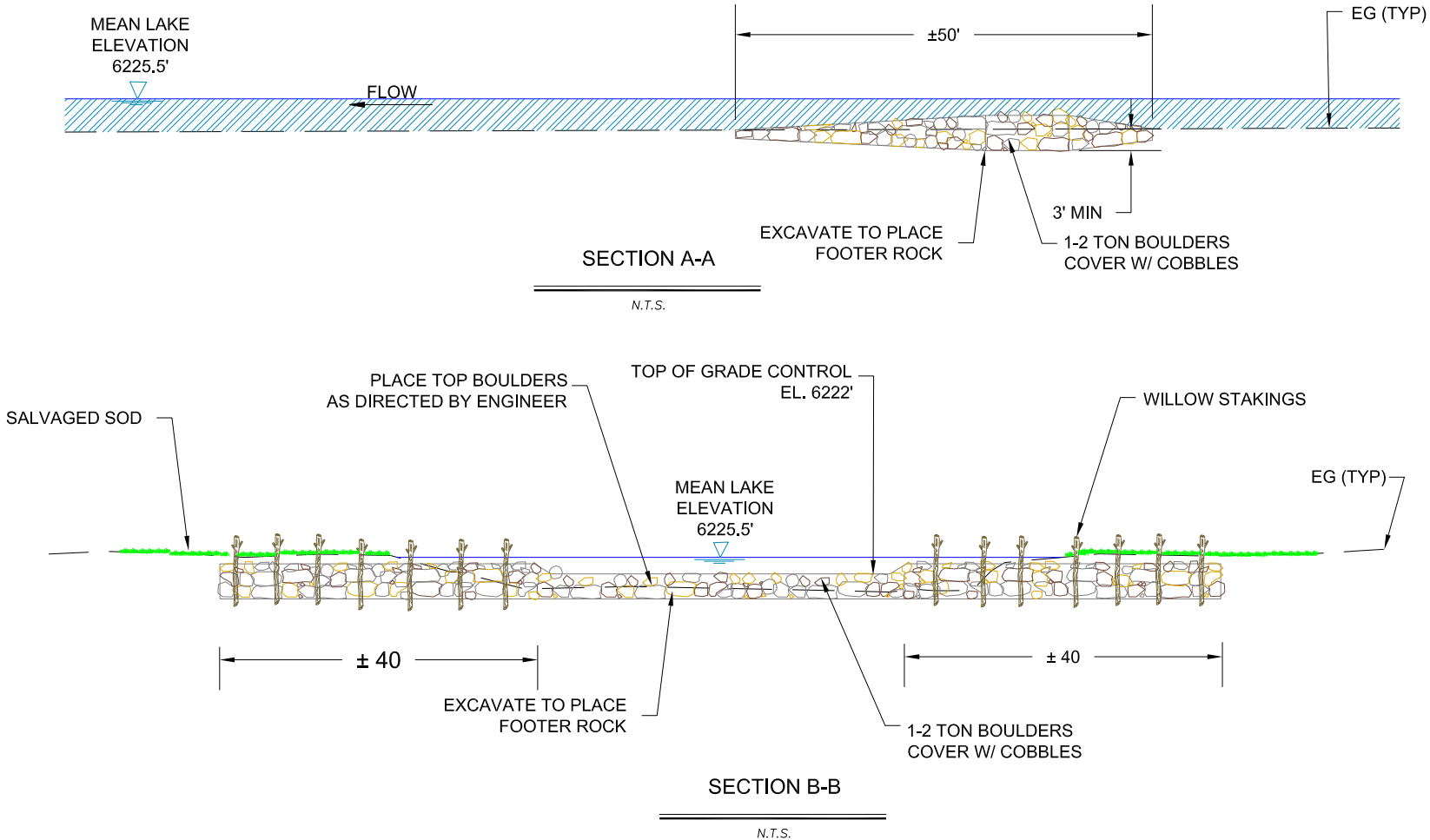
RE-ESTABLISH THE RIVER-OVERFLOW LAGOON
NOTES:

1. THE SURFACE WATER OF THE SAILING LAGOON IS PART OF THE TAHOE KEYS MARINA AND IS HYDRAULICALLY CONNECTED TO LAKE TAHOE, A RESULT OF PRIOR DREDGING AND FILL ACTIVITIES TO PROVIDE VARIOUS NAVIGATION ROUTES SINCE THE 1950'S.
2. ALTERNATIVES 1, 2, AND 3 WILL RESTORE A LAGOON FEATURE ON THE UPPER TRUCKEE BY: 1) CONSTRUCTING A BULKHEAD AT THE EXISTING SAILING LAGOON TO BLOCK ITS OPEN CONNECTION WITH THE MARINA; AND 2) RE-EXCAVATING THE FILL BETWEEN THE SAILING LAGOON AND THE UPPER TRUCKEE SO THAT THE RIVER IS A SURFACE WATER SOURCE TO THE LAGOON.
3. THE LOWER WEST SIDE PLAN SHEETS SHOW THE PROPOSED ALTERNATIVES FOR RECONNECTING THE SAILING LAGOON TO THE UPPER TRUCKEE RIVER.

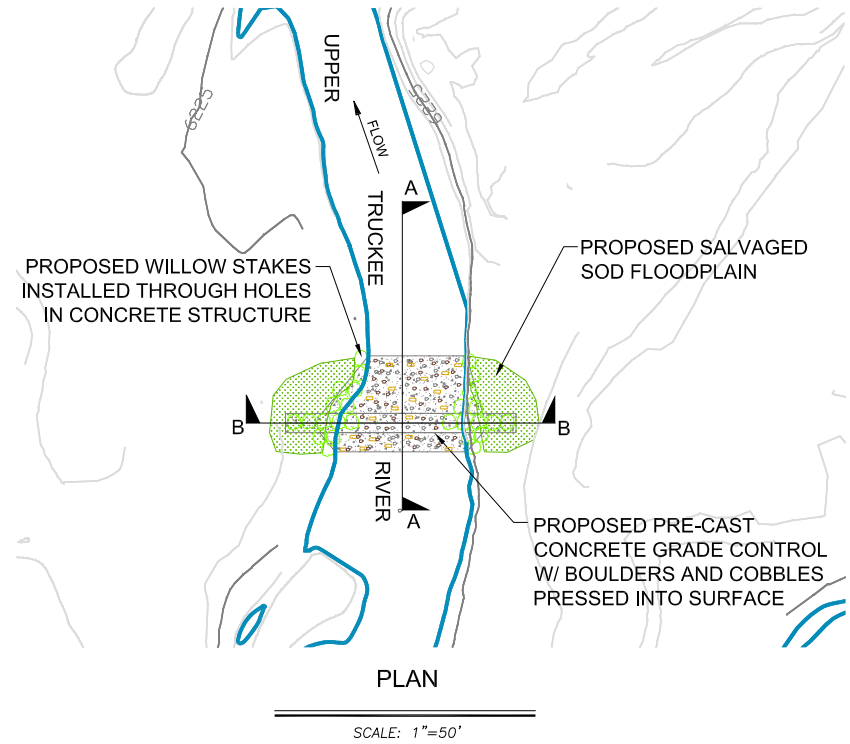


2
D-6

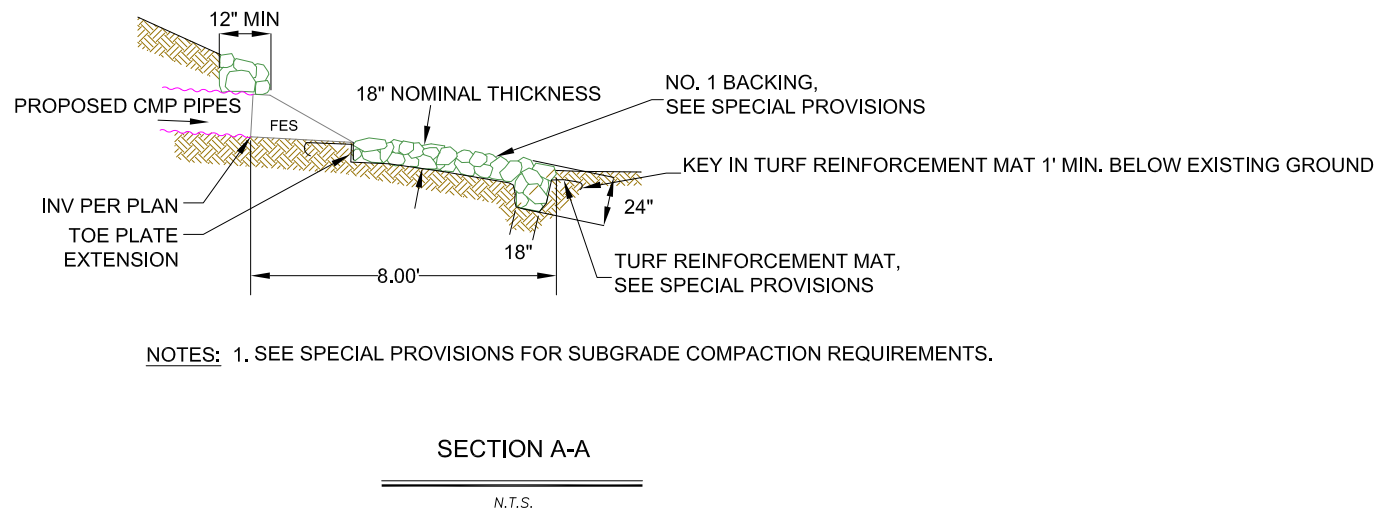
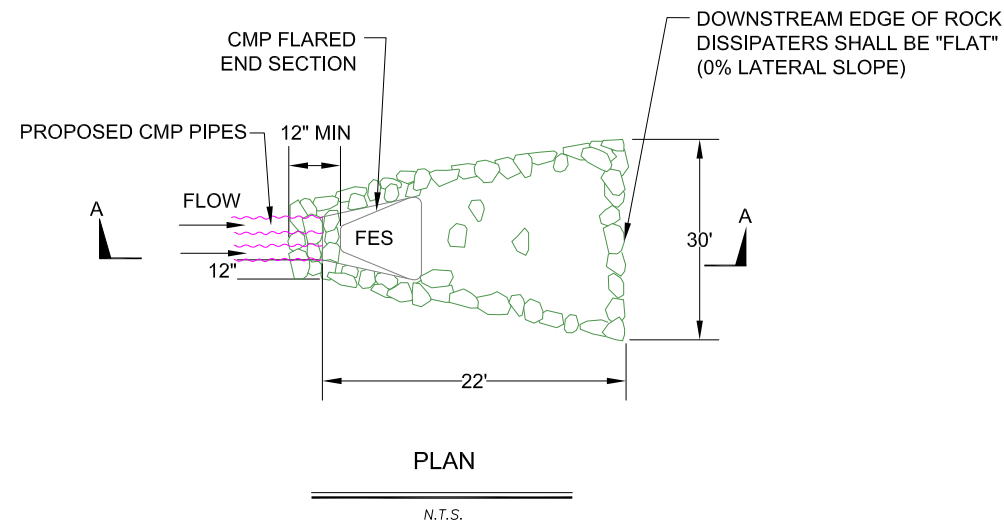
BIOENGINEERED GRADE CONTROL AT RIVER MOUTH - TYPE I



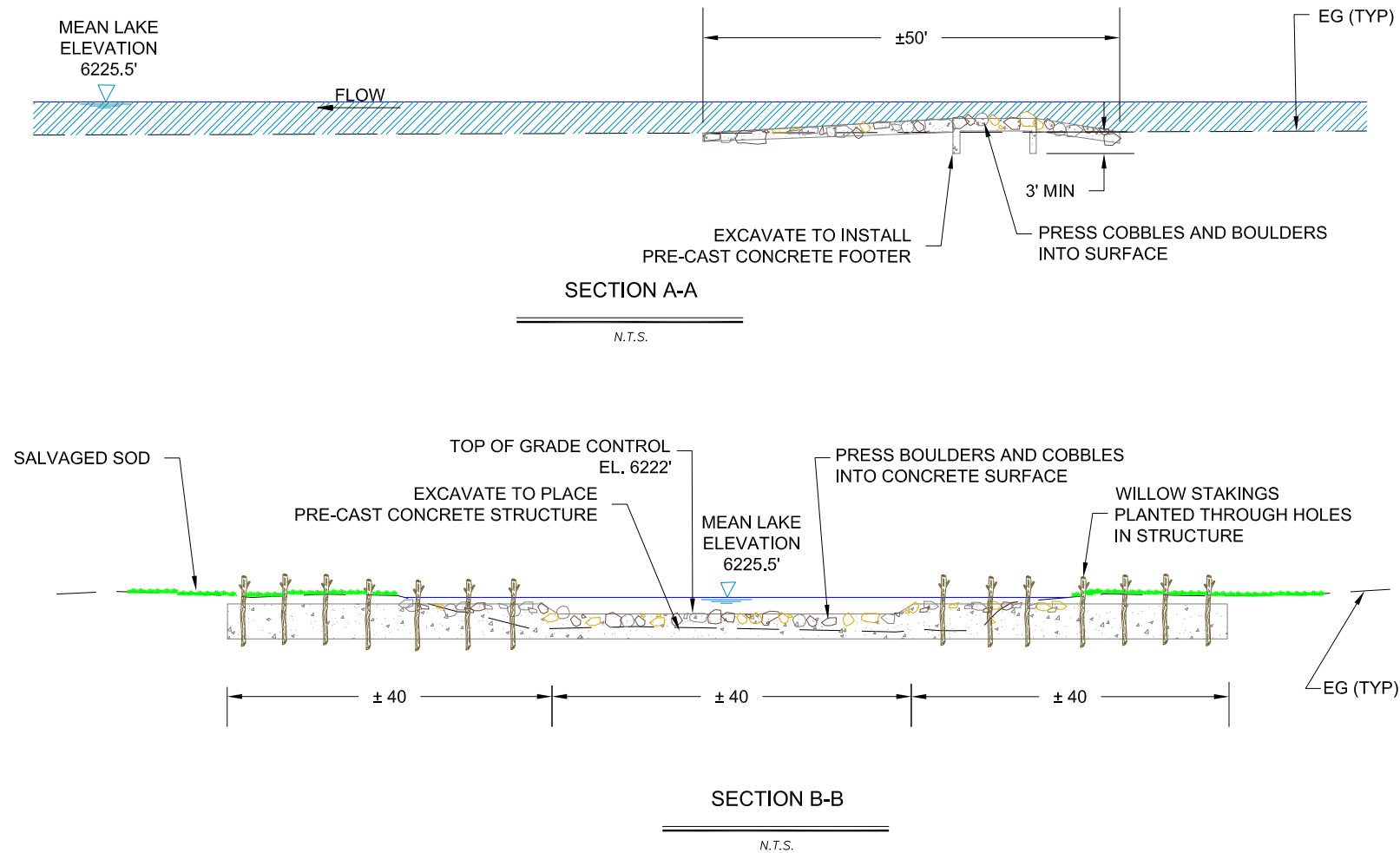
SCHEMATIC DESIGN PLANS
& DETAILS
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1
D-7 BIOENGINEERED GRADE CONTROL AT RIVER MOUTH - TYPE II



2
D-7 ROCK RIP-RAP ENERGY DISSIPATOR



UPPER TRUCKEE RIVER AND MARSH RESTORATION PROJECT

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Zephyr Cove, NV 89448
Tel: 775.588.9069

DETAILS

D-7

REVISIONS

#	description	date

scale: AS SHOWN

job no.: 00110066.04

drawn by: CK

checked by: CM

sheet no.: D-7

sheet 32 of 45

date: 11/20/07

SCHEMATIC DESIGN PLANS
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DETAILS

D-8

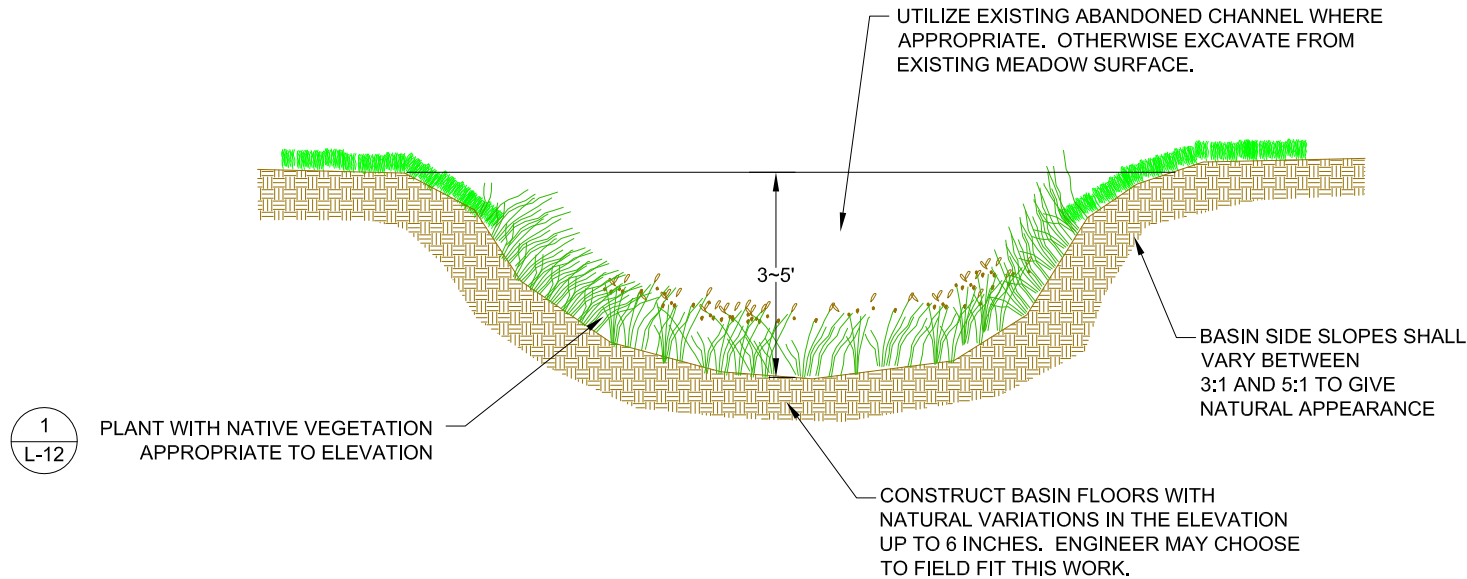
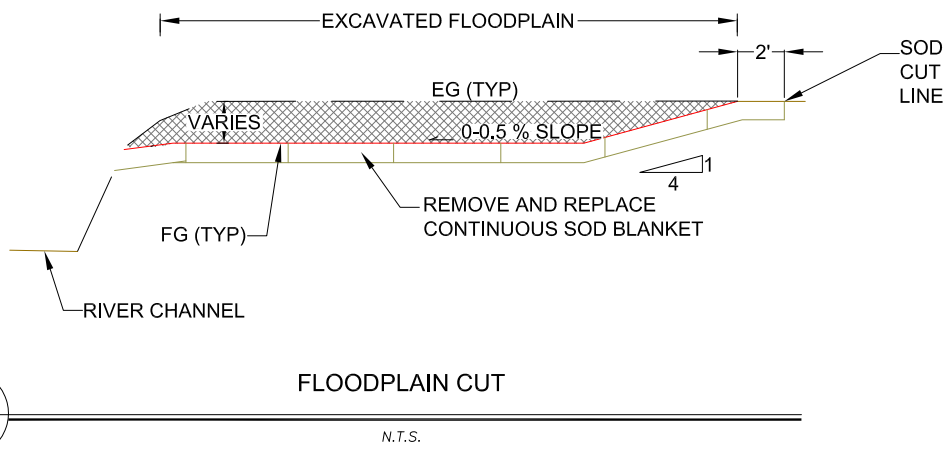
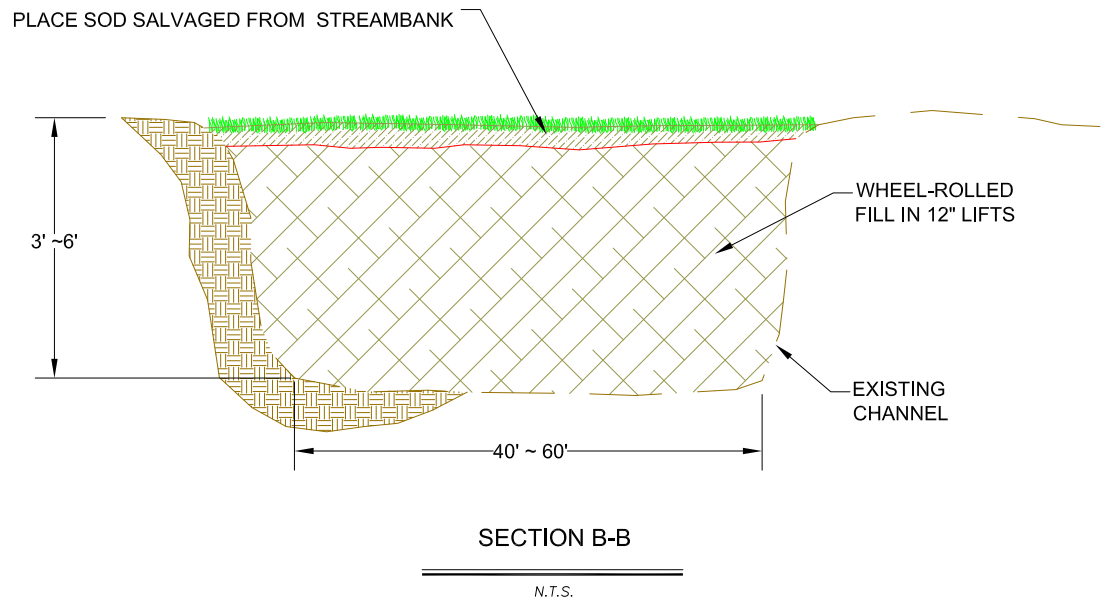
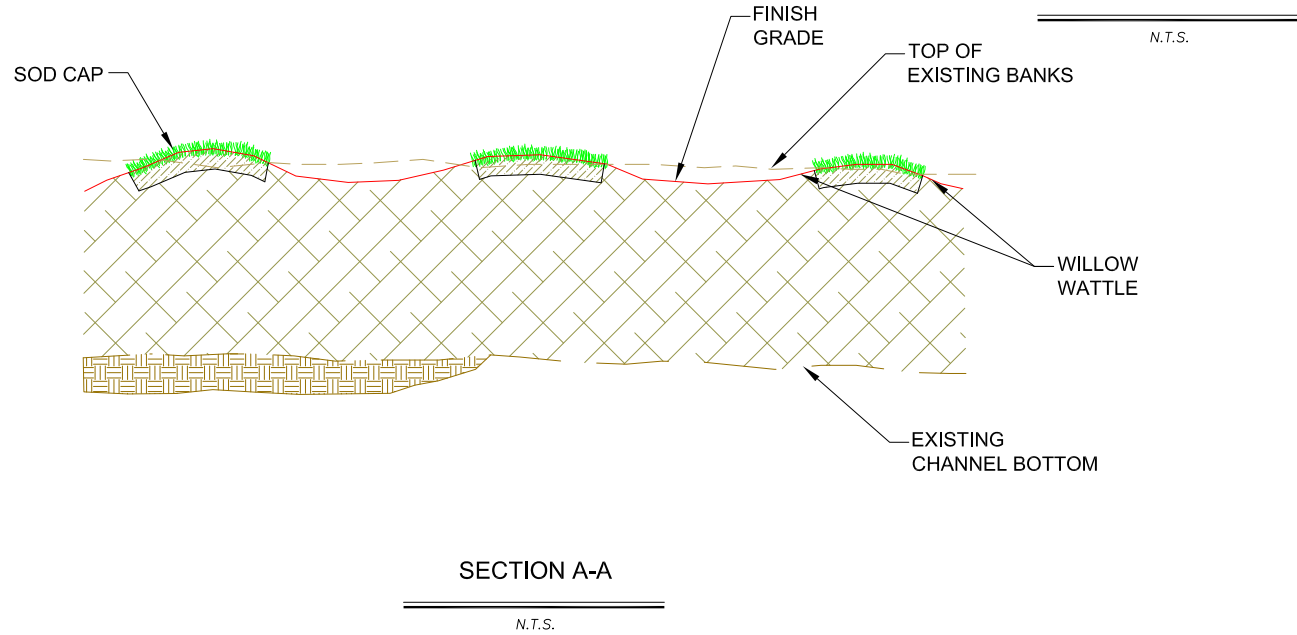
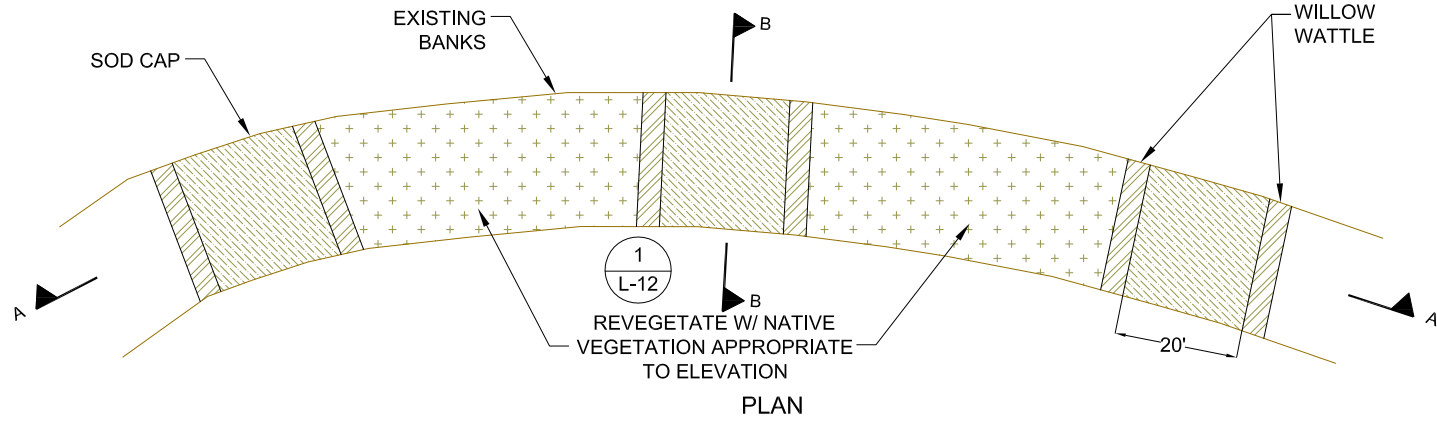
REVISIONS

#	description	date

scale:	AS SHOWN
job no.:	00110066.04
drawn by:	CK
checked by:	CM

sheet no.: D-8

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date: 11/20/07



SCHEMATIC DESIGN PLANS
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DETAILS

D-9

REVISIONS

#	description	date

scale: AS SHOWN

job no.: 00110066.04

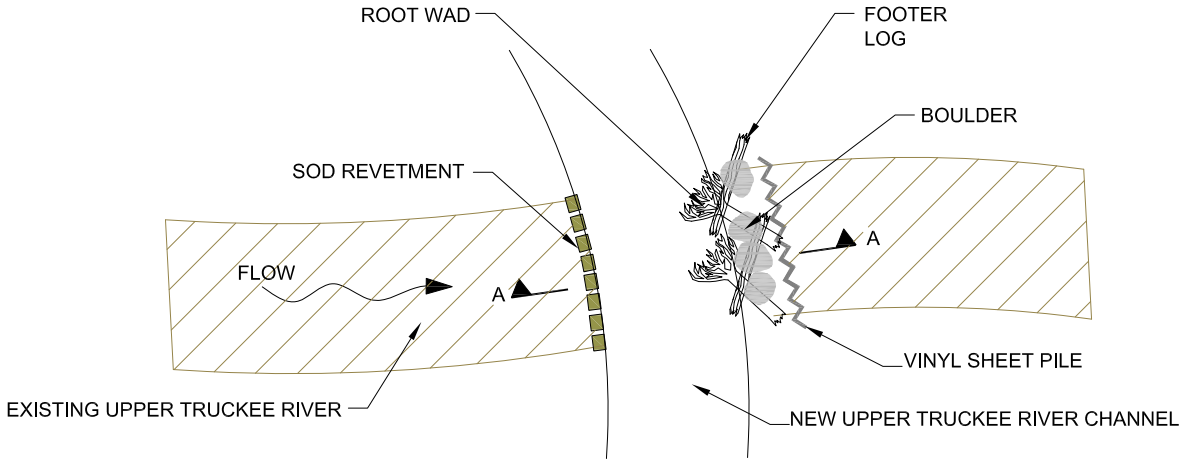
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sheet no.: D-9

sheet 34 of 45

date: 11/20/07

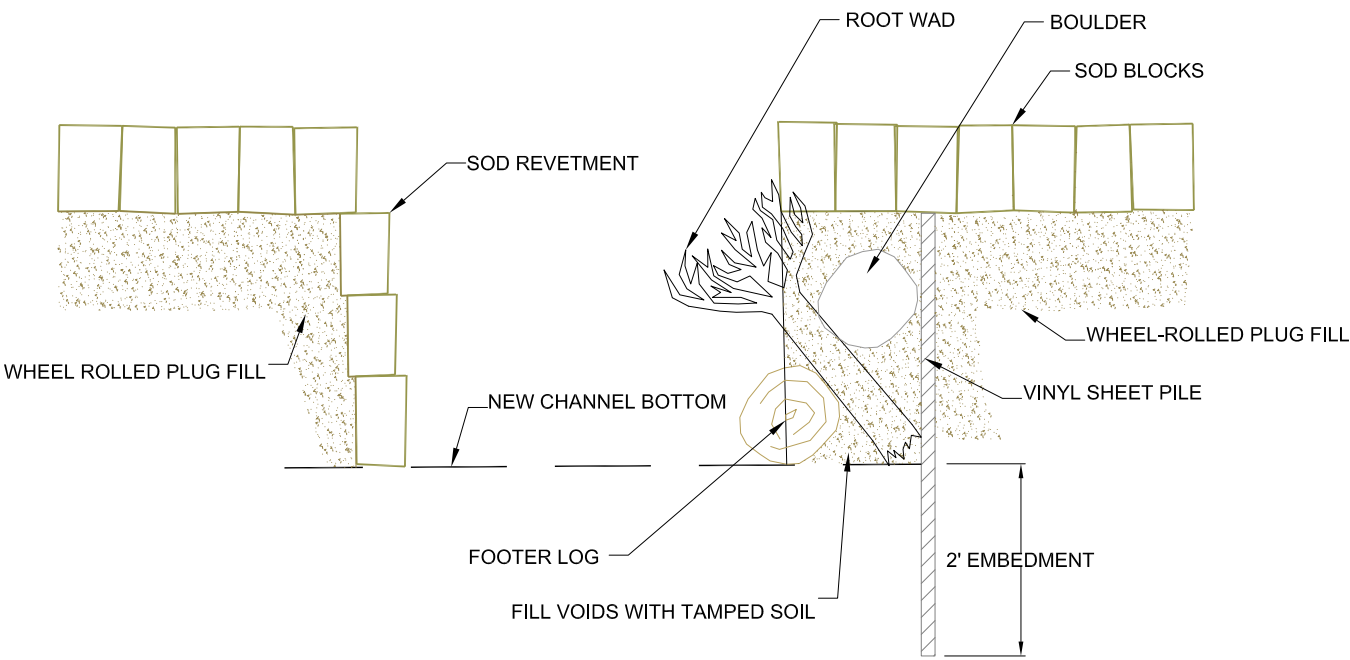


NOTES:

1. BOULDERS SHALL BE ¼ TO ½ TONS EACH.
2. FOOTER LOGS SHALL BE 8-12 INCHES IN DIAMETER AND 10-16 FEET IN LENGTH.
3. ROOTWADS SHALL HAVE A BOLE DIAMETER OF 8-16 INCHES AND A LENGTH OF 10-15 FEET.
4. ANGLES AND ELEVATIONS OF ROOT WADS SHALL VARY.
5. ROOT FANS SHALL BE 3-5 FEET IN DIAMETER.
6. FOOTER LOG SHALL EXTEND 4 FEET PERPENDICULARLY ON EITHER SIDE OF THE ROOT WAD.

PLAN

N.T.S.



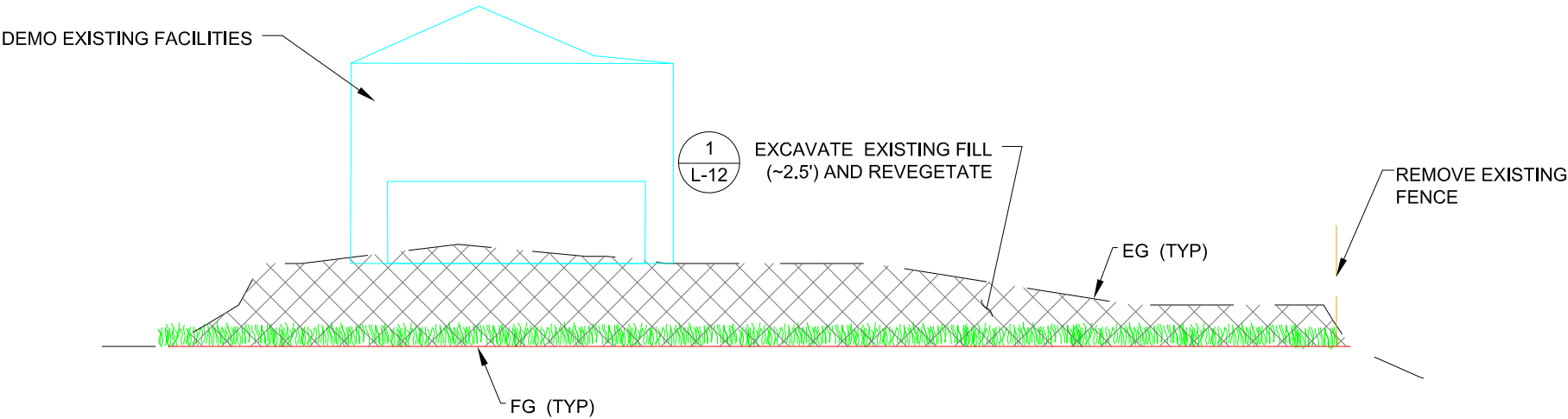
SECTION A-A

N.T.S.

1
D-9

LATERAL GRADE CONTROL

N.T.S.



2
D-9

TKPOA YARD RESTORATION

N.T.S.

SCHEMATIC DESIGN PLANS
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NOTE: WHERE TITLED "BIKE TRAIL" SHALL MEAN THE SAME AS "BIKE PATH".



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BIKE TRAIL

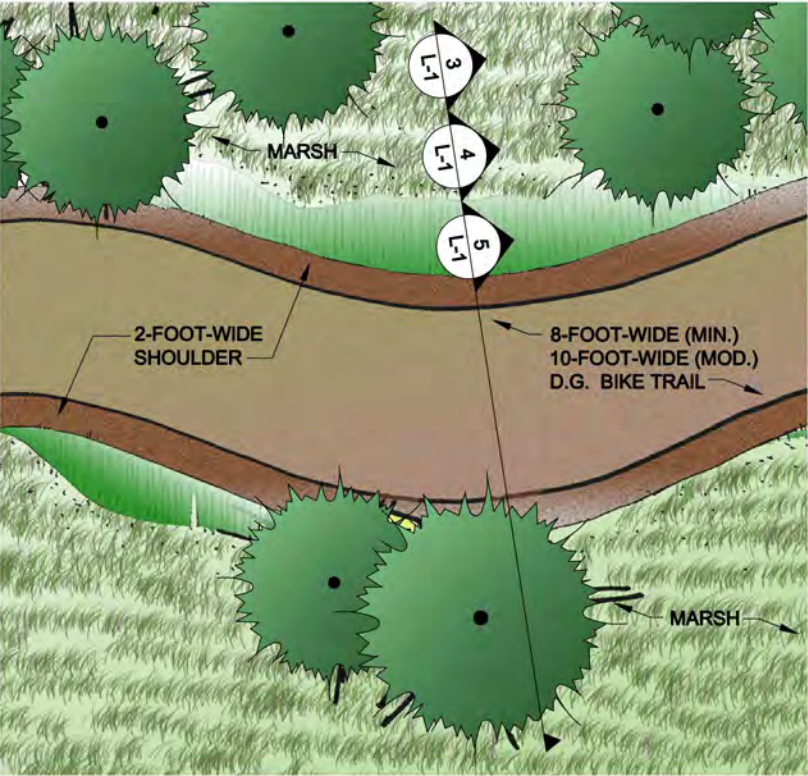
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REVISIONS		
#	description	date

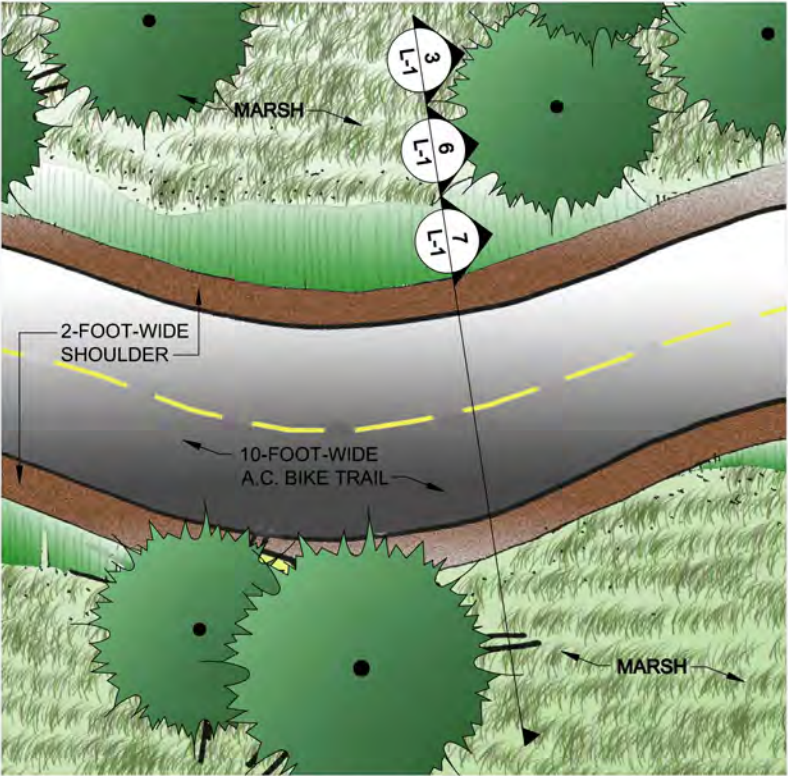
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job no.:	00110066.04
drawn by:	ML
checked by:	JZ

sheet no.: L-1

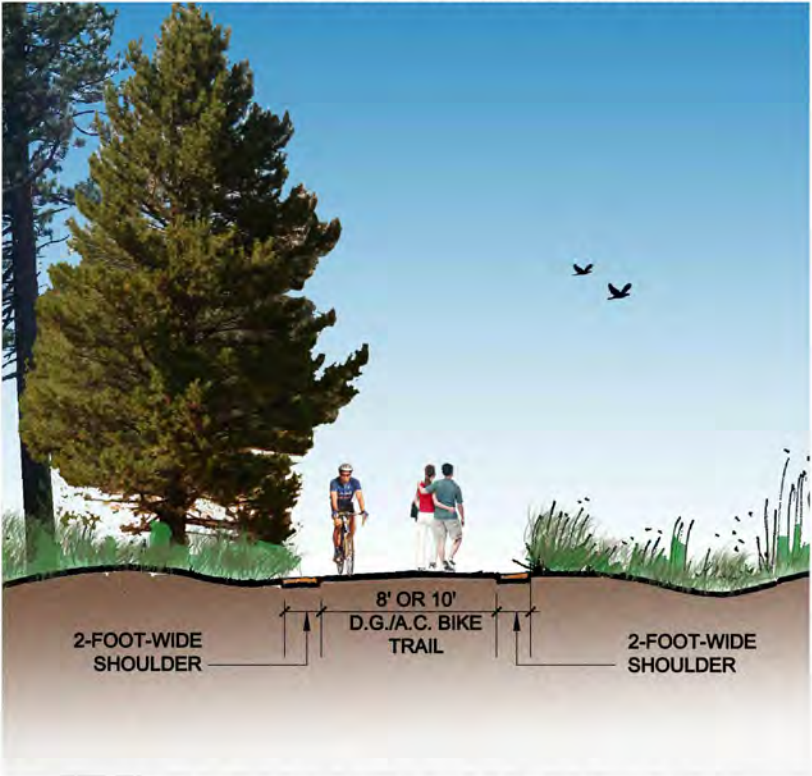
sheet 35 of 45
date: 05/02/12



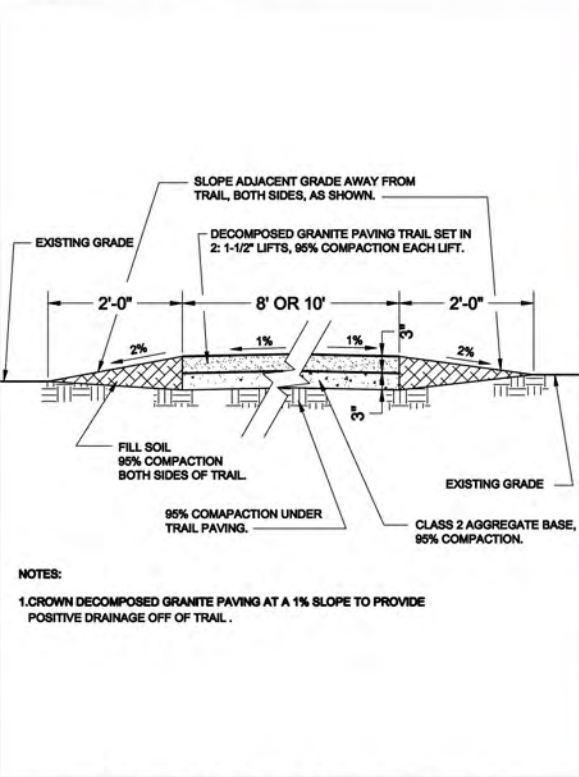
1 D.G. BIKE TRAIL (MIN./MOD.)
L-1 SCALE: NTS PLAN VIEW



2 A.C. BIKE TRAIL (MAX.)
L-1 SCALE: NTS PLAN VIEW



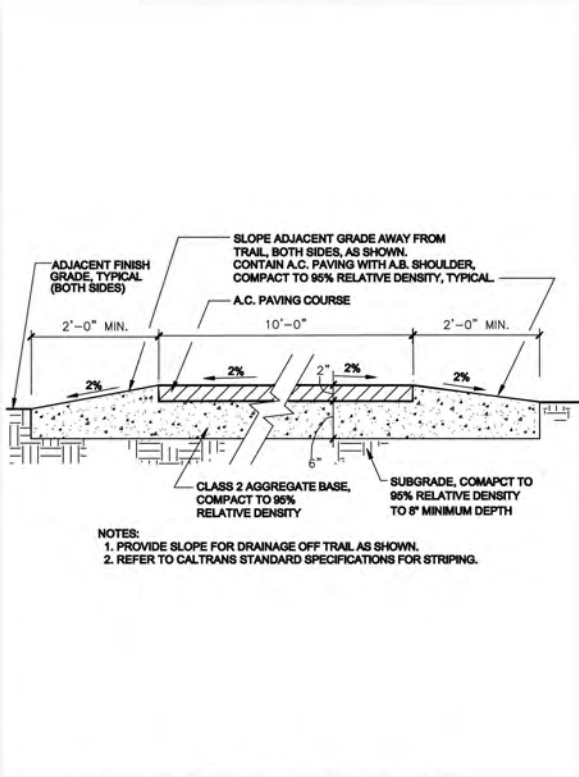
3 D.G./A.C. BIKE TRAIL (MIN./MOD./MAX.)
L-1 SCALE: NTS ELEVATION



4 D.G. BIKE TRAIL (MIN./MOD.)
L-1 SCALE: NTS SECTION



5 D.G. BIKE TRAIL (MIN./MOD.)
L-1 SCALE: NTS REPRESENTATIVE EXAMPLE



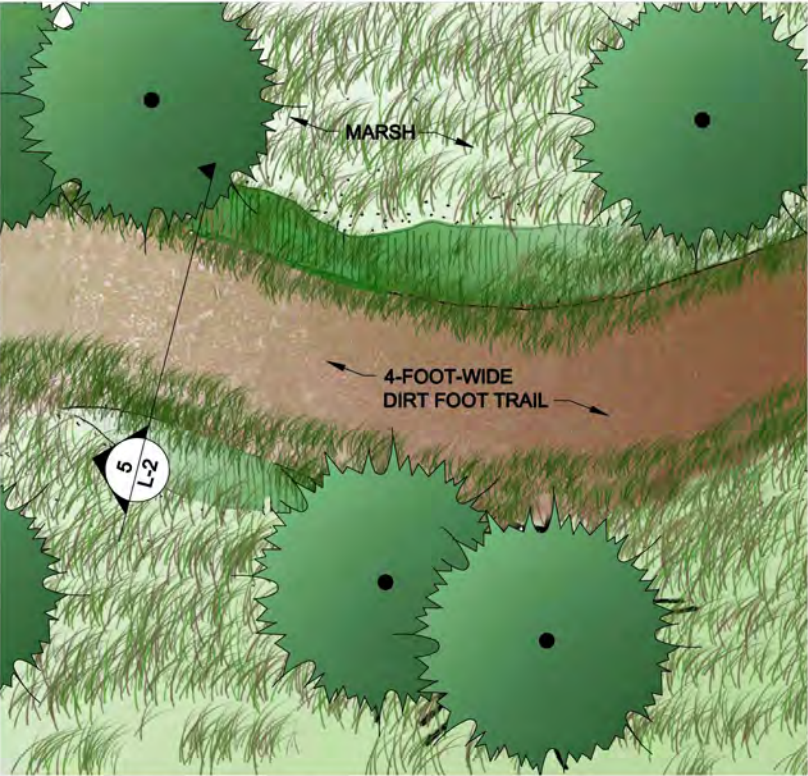
6 A.C. BIKE TRAIL (MAX.)
L-1 SCALE: NTS SECTION



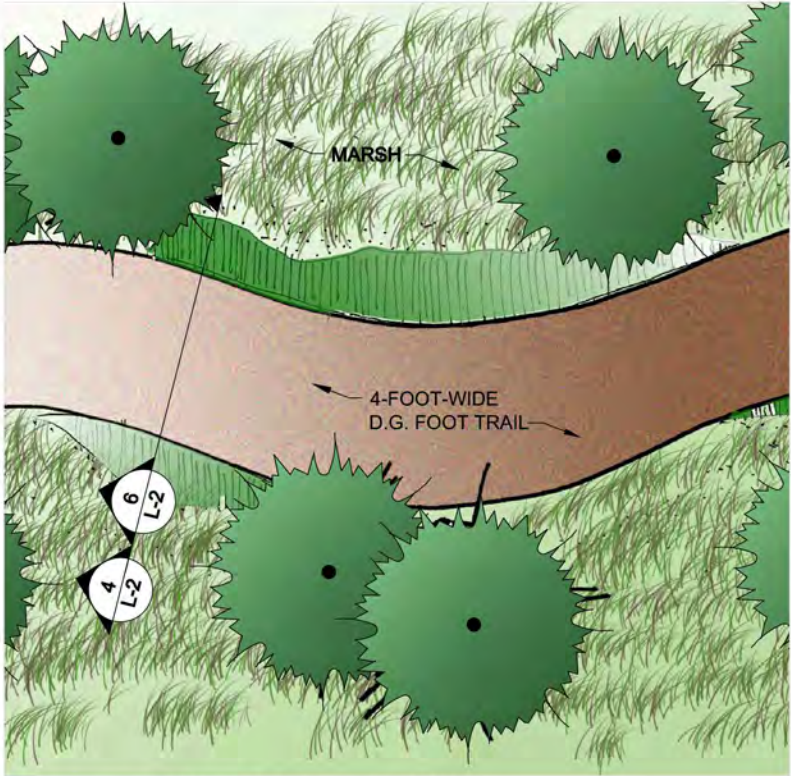
7 A.C. BIKE TRAIL (MAX.)
L-1 SCALE: NTS REPRESENTATIVE EXAMPLE

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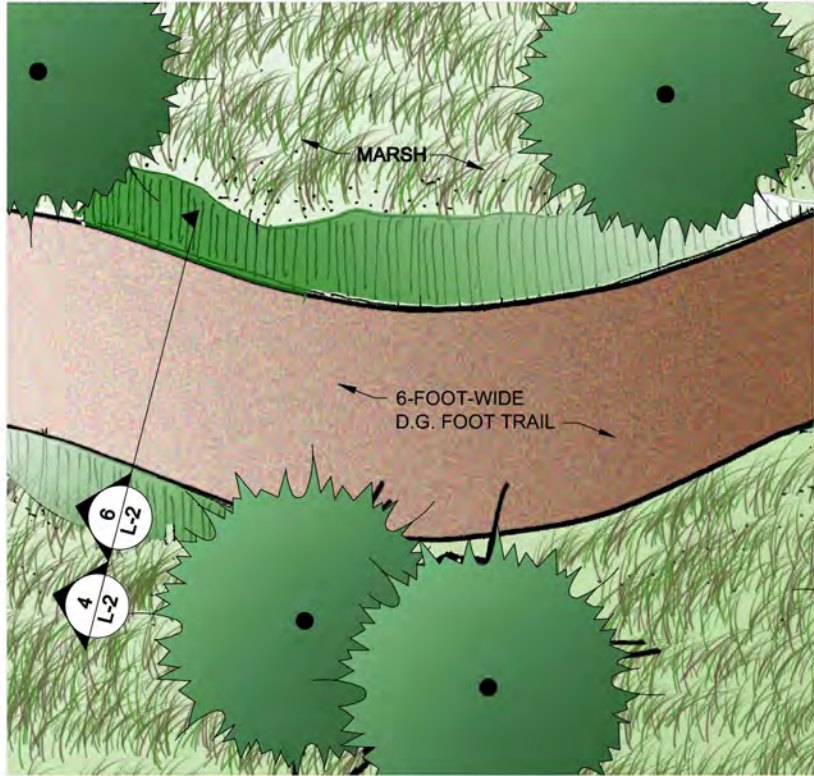
SCHEMATIC DESIGN PLANS
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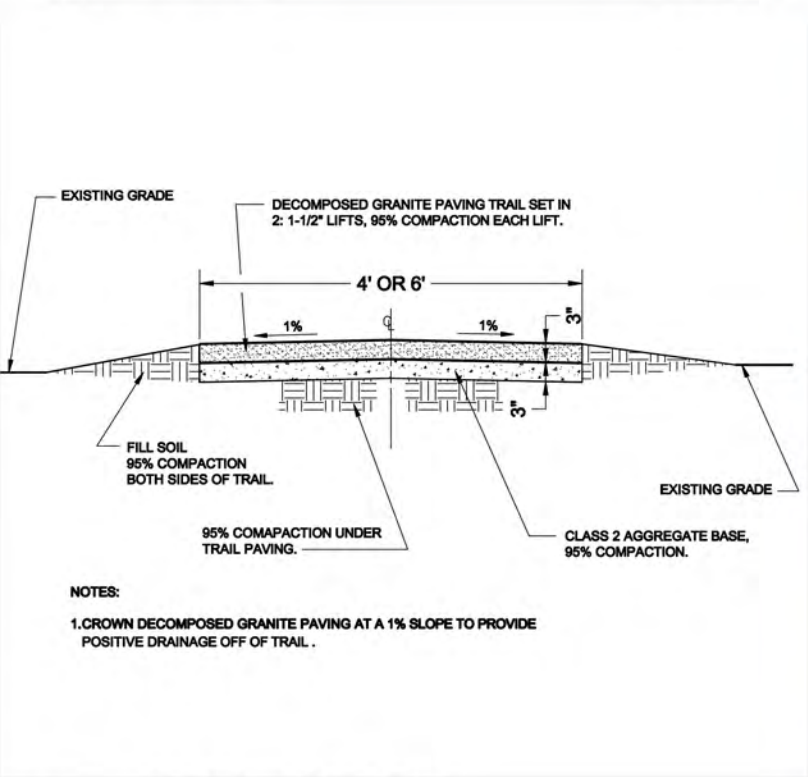
1
L-2 **FOOT TRAIL (MIN.)**
SCALE: NTS PLAN VIEW



2
L-2 **FOOT TRAIL (MOD.)**
SCALE: NTS PLAN VIEW



3
L-2 **FOOT TRAIL (MAX.)**
SCALE: NTS PLAN VIEW



NOTES:
1. CROWN DECOMPOSED GRANITE PAVING AT A 1% SLOPE TO PROVIDE POSITIVE DRAINAGE OFF OF TRAIL.

4
L-2 **FOOT TRAIL (MAX.)**
SCALE: NTS SECTION



5
L-2 **FOOT TRAIL (MIN.)**
SCALE: NTS REPRESENTATIVE EXAMPLE



6
L-2 **FOOT TRAIL (MOD./MAX.)**
SCALE: NTS REPRESENTATIVE EXAMPLE

NOTES:
MIN. = MINIMUM RECREATION INFRASTRUCTURE
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NOTE: WHERE TITLED "FOOT TRAIL" SHALL MEAN THE SAME AS "PEDESTRIAN TRAIL".



UPPER TRUCKEE RIVER
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FOOT TRAIL

L-2

REVISIONS		
#	description	date

scale: NOT TO SCALE
job no.: 00110066.04
drawn by: ML
checked by: JZ

sheet no.: L-2

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date: 05/02/12

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SCHEMATIC DESIGN PLANS
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VIEW POINT

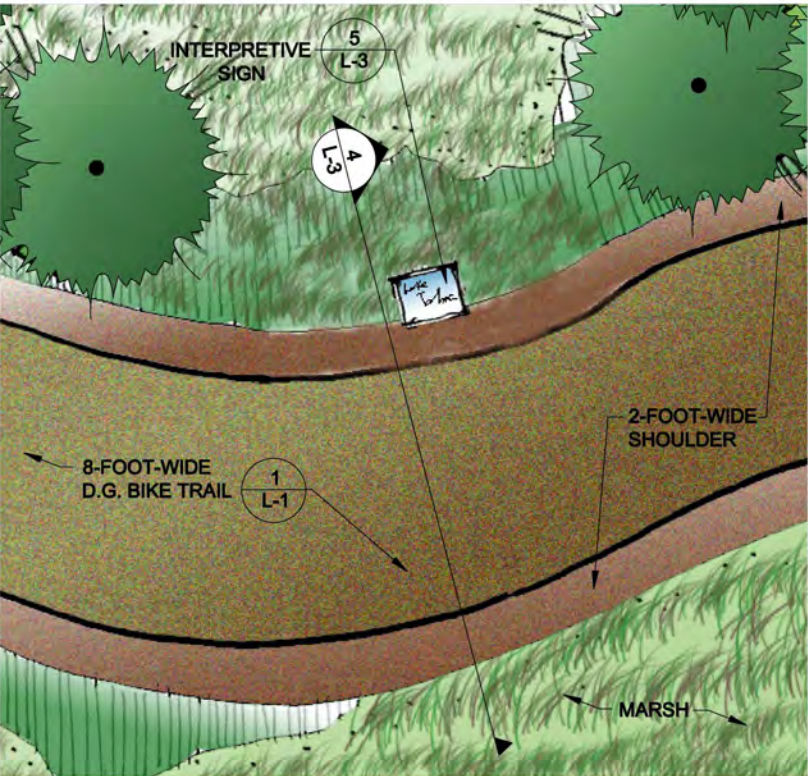
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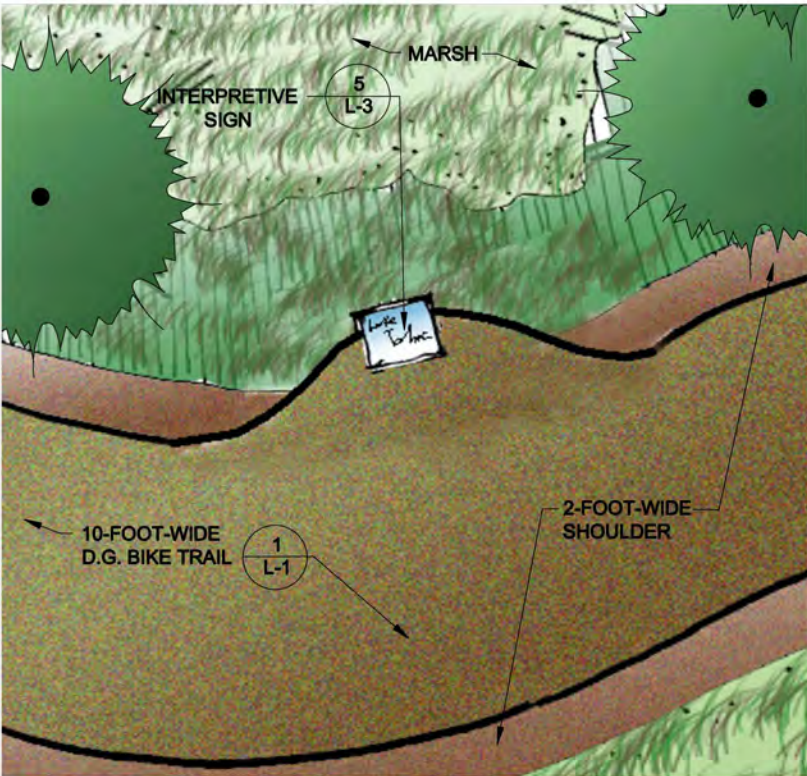
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sheet no.: L-3

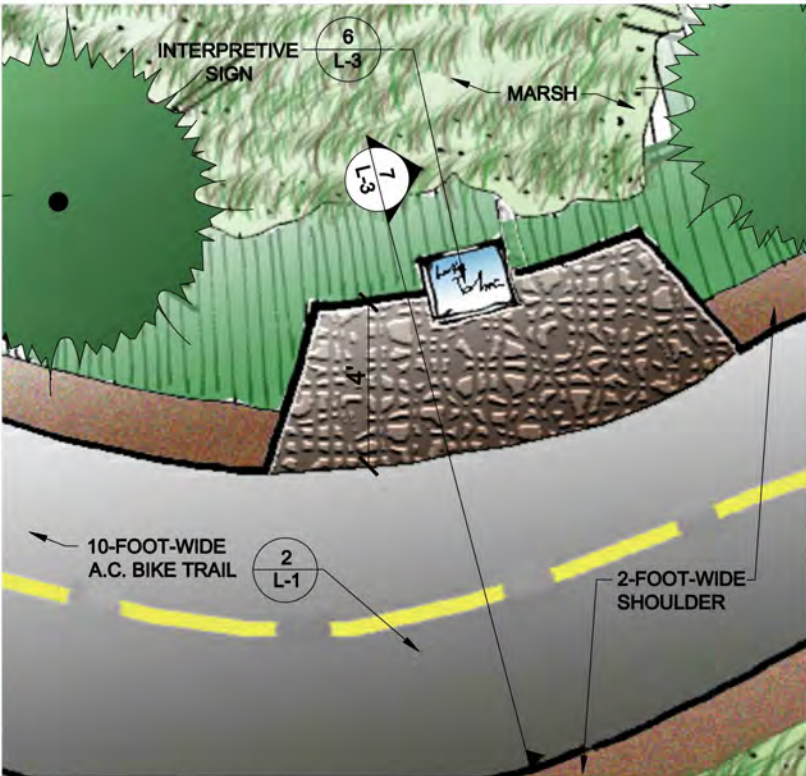
sheet 37 of 45
date: 05/02/12



1 VIEW POINT (MIN.)
L-3 SCALE: NTS PLAN VIEW



2 VIEW POINT (MOD.)
L-3 SCALE: NTS PLAN VIEW



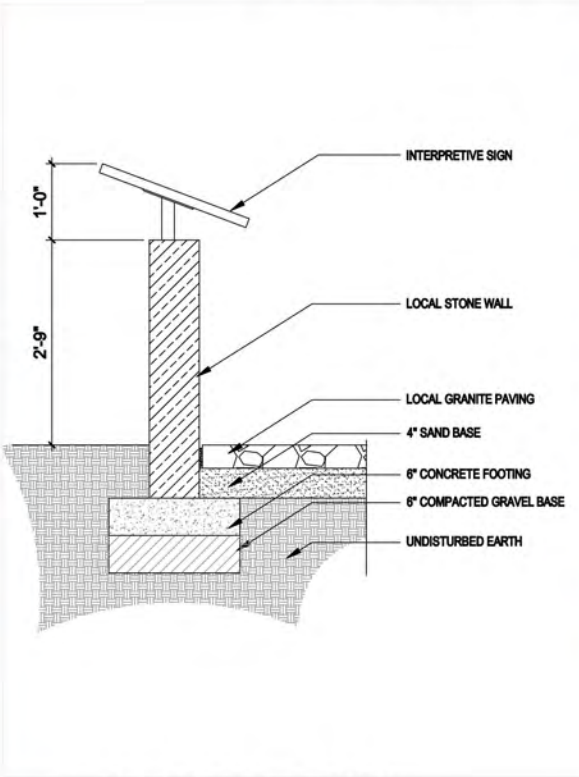
3 VIEW POINT (MAX.)
L-3 SCALE: NTS PLAN VIEW



4 VIEW POINT (MIN./MOD.)
L-3 SCALE: NTS ELEVATION



5 VIEW POINT (MIN./MOD.)
L-3 SCALE: NTS REPRESENTATIVE EXAMPLE



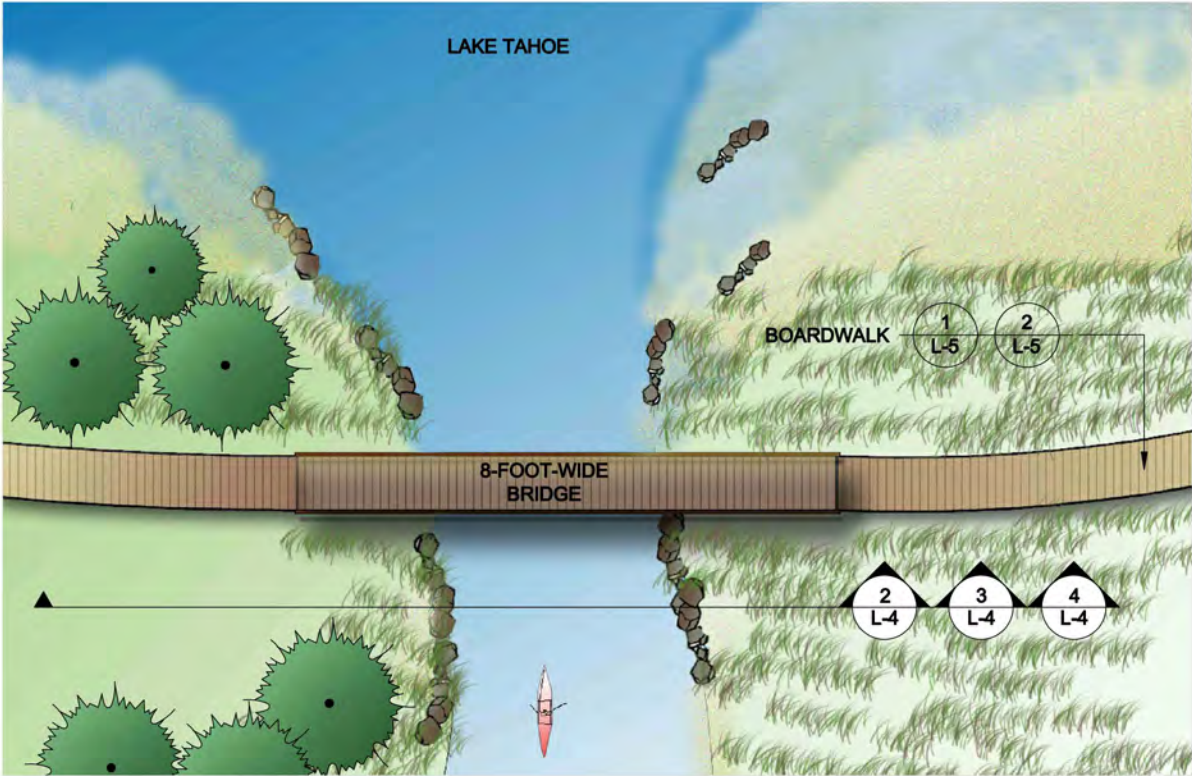
6 VIEW POINT (MAX.)
L-3 SCALE: NTS SECTION



7 VIEW POINT (MAX.)
L-3 SCALE: NTS ELEVATION

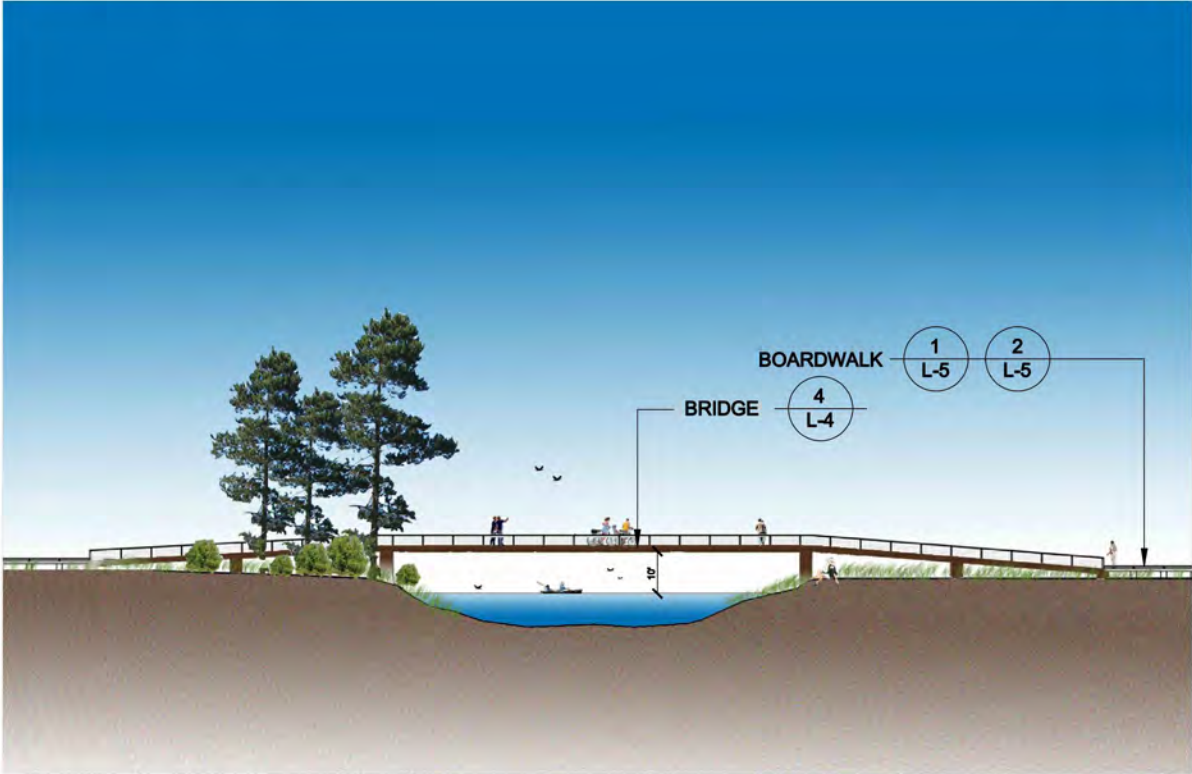
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SCHEMATIC DESIGN PLANS
& DETAILS
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1
L-4
BRIDGE
SCALE: NTS

PLAN VIEW



3
L-4
BRIDGE
SCALE: NTS

ELEVATION



2
L-4
BRIDGE
SCALE: NTS

ELEVATION



4
L-4
BRIDGE
SCALE: NTS

REPRESENTATIVE EXAMPLE



UPPER TRUCKEE RIVER
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BRIDGE

L-4

REVISIONS		
#	description	date

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job no.:	00110066.04
drawn by:	ML
checked by:	JZ

sheet no.: L-4

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date: 05/02/12

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SCHEMATIC DESIGN PLANS
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BOARDWALK

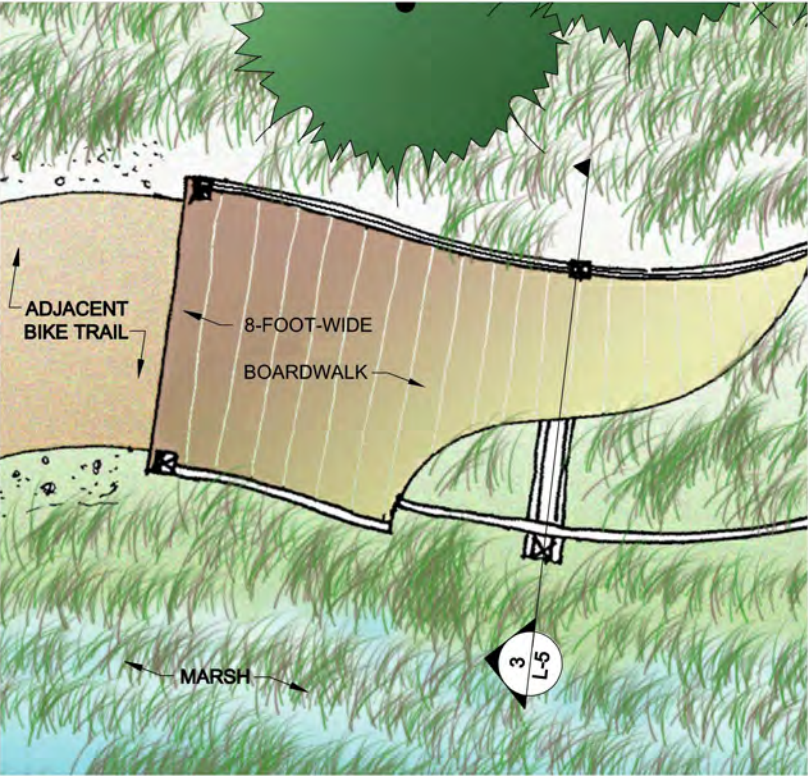
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REVISIONS		
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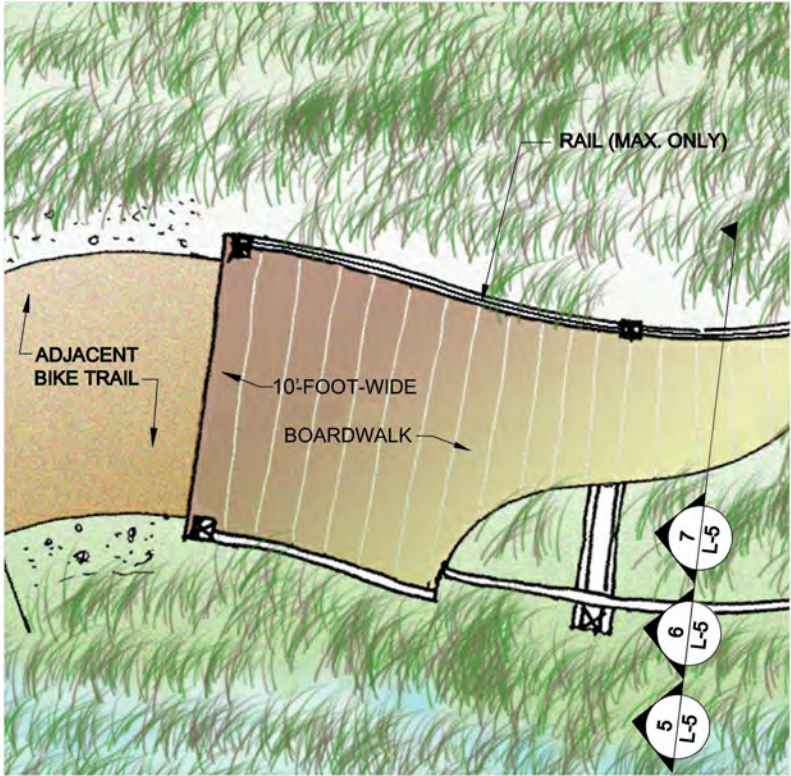
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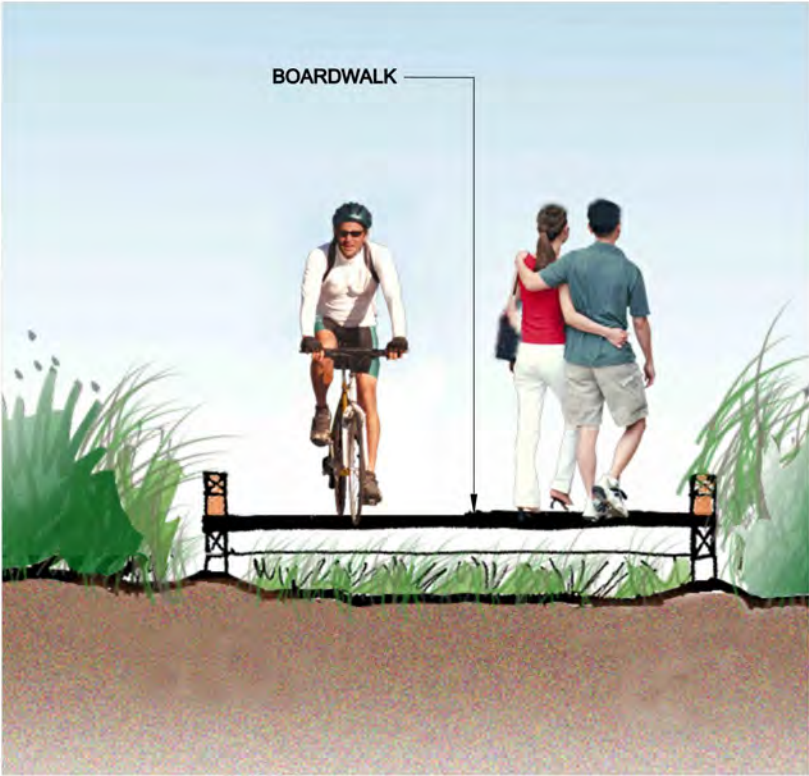
sheet 39 of 45
date: 05/02/12



1 BOARDWALK (MIN.)
L-5 SCALE: NTS PLAN VIEW



2 BOARDWALK (MOD./MAX.)
L-5 SCALE: NTS PLAN VIEW



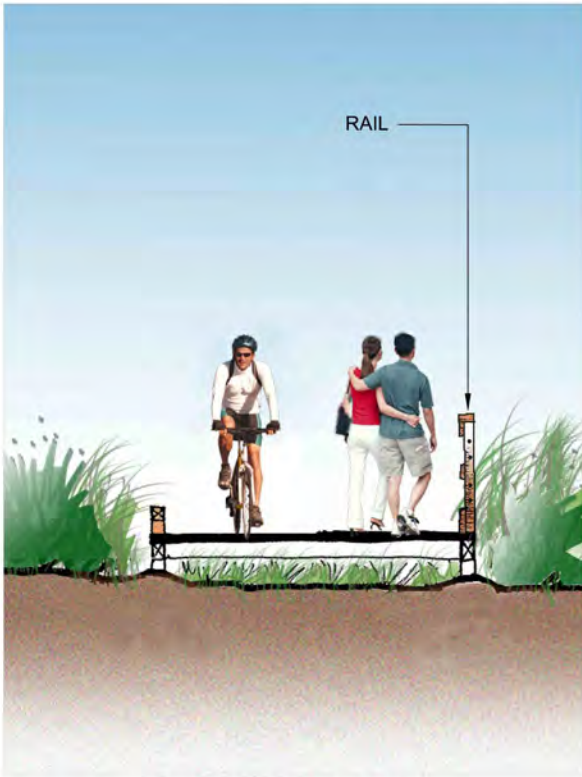
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L-5 SCALE: NTS PLAN VIEW



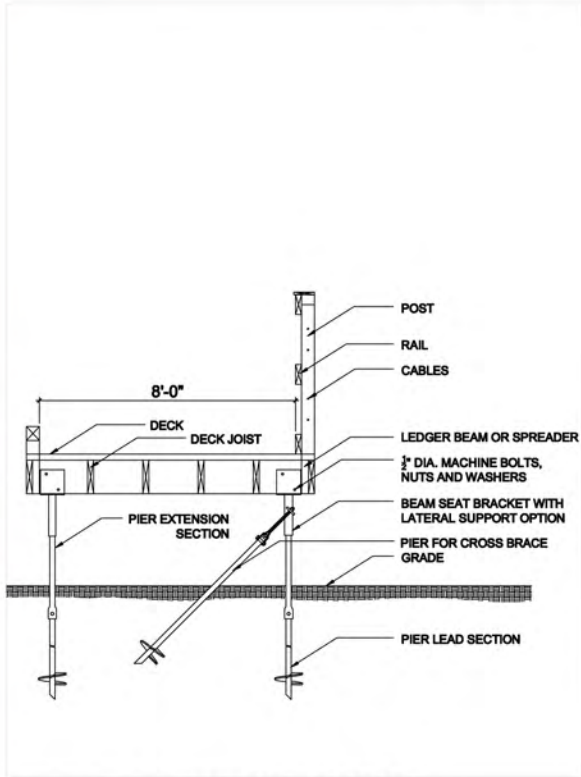
4 BOARDWALK (MIN.)
L-5 SCALE: NTS REPRESENTATIVE EXAMPLE



5 BOARDWALK (MOD.)
L-5 SCALE: NTS REPRESENTATIVE EXAMPLE



6 BOARDWALK (MAX.)
L-5 SCALE: NTS ELEVATION



7 BOARDWALK (MAX.)
L-5 SCALE: NTS SECTION

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OBSERVATION AREA
TYPE 1

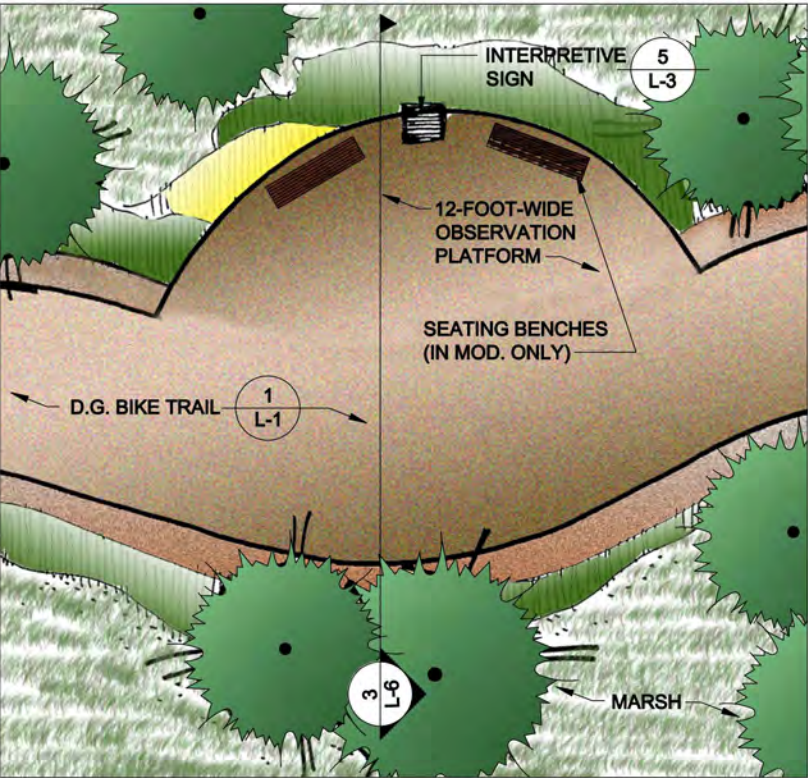
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REVISIONS		
#	description	date

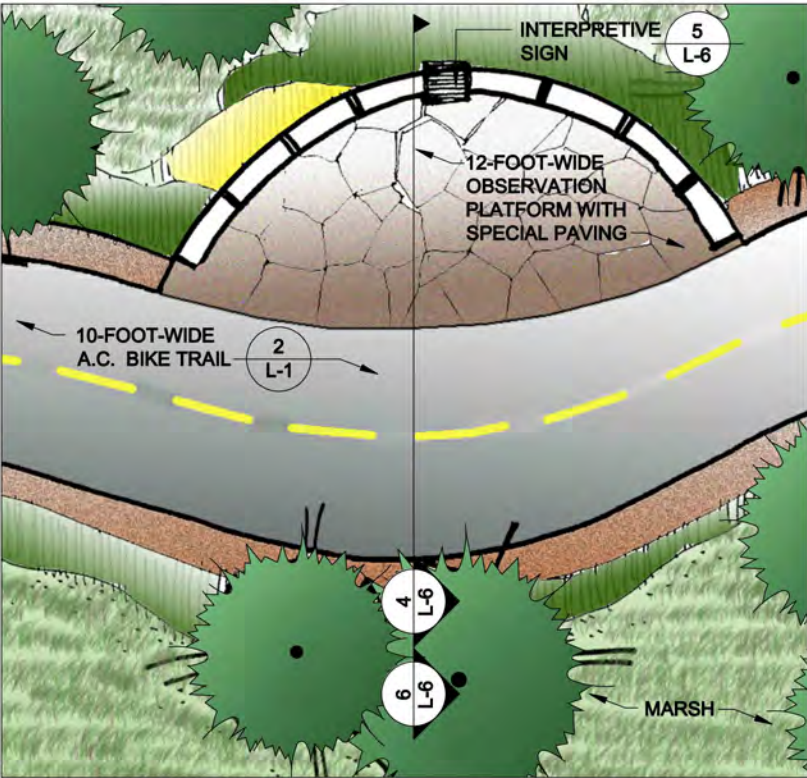
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checked by:	JZ

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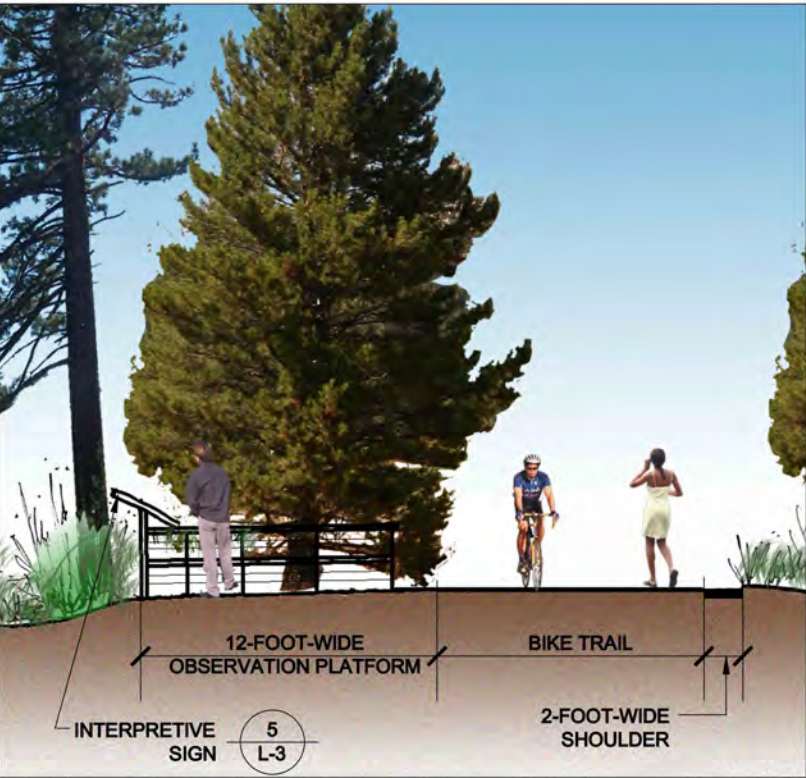
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date: 05/02/12



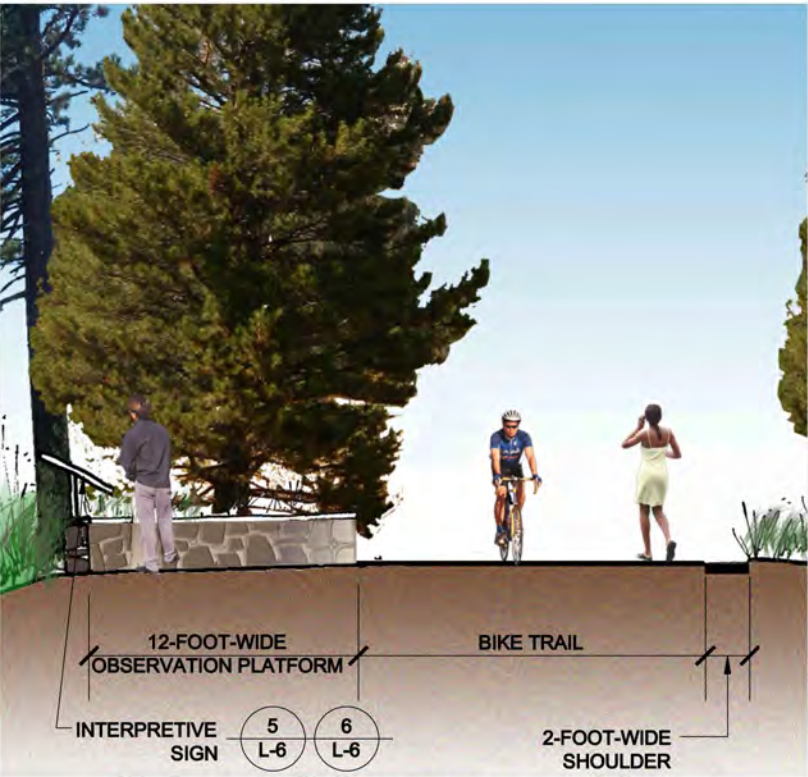
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L-6 SCALE: NTS PLAN VIEW



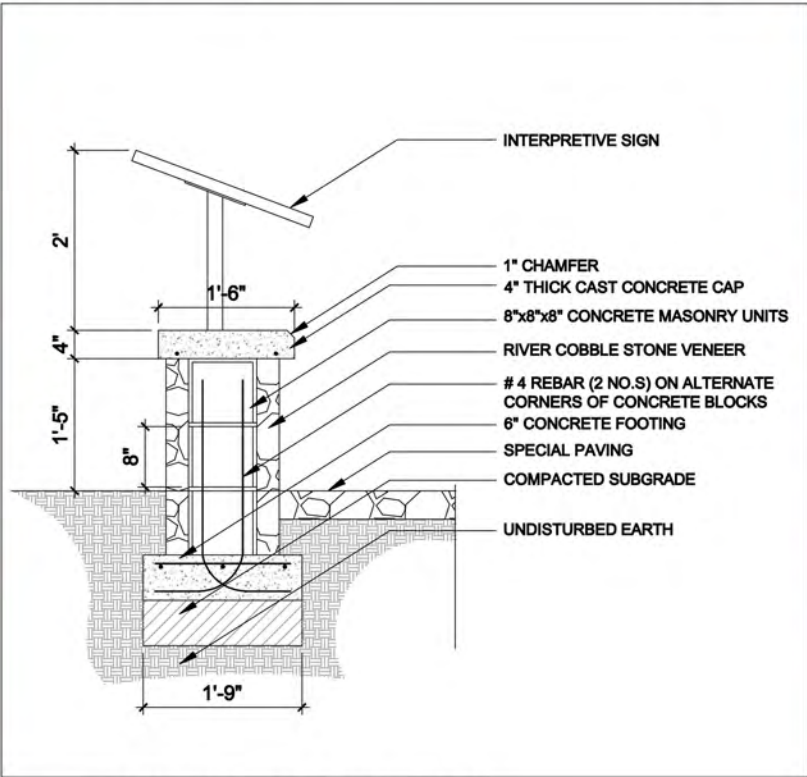
2 OBSERVATION AREA (MAX.)
L-6 SCALE: NTS PLAN VIEW



3 OBSERVATION AREA (MIN.)
L-6 SCALE: NTS ELEVATION



4 OBSERVATION AREA (MAX.)
L-6 SCALE: NTS ELEVATION



5 OBSERVATION AREA (MAX.)
L-6 SCALE: NTS SECTION



6 OBSERVATION AREA
L-6 SCALE: NTS REPRESENTATIVE EXAMPLE

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OBSERVATION AREA
TYPE 2

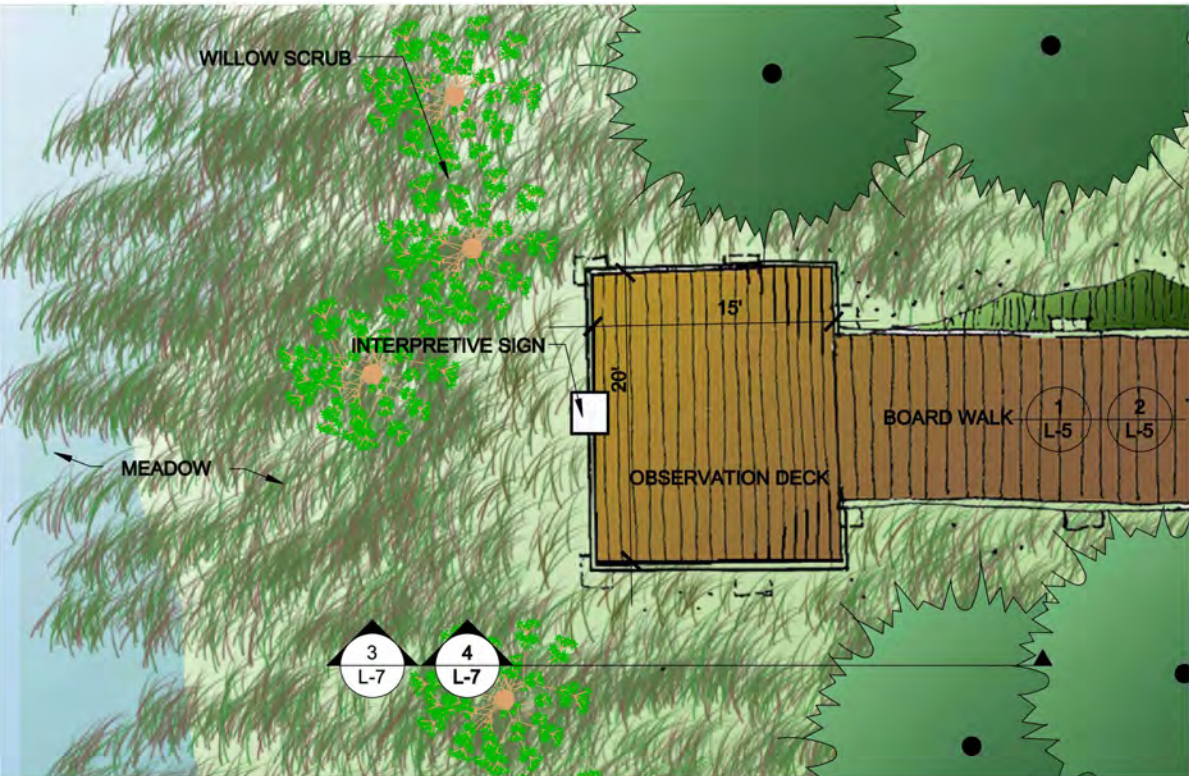
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checked by:	JZ

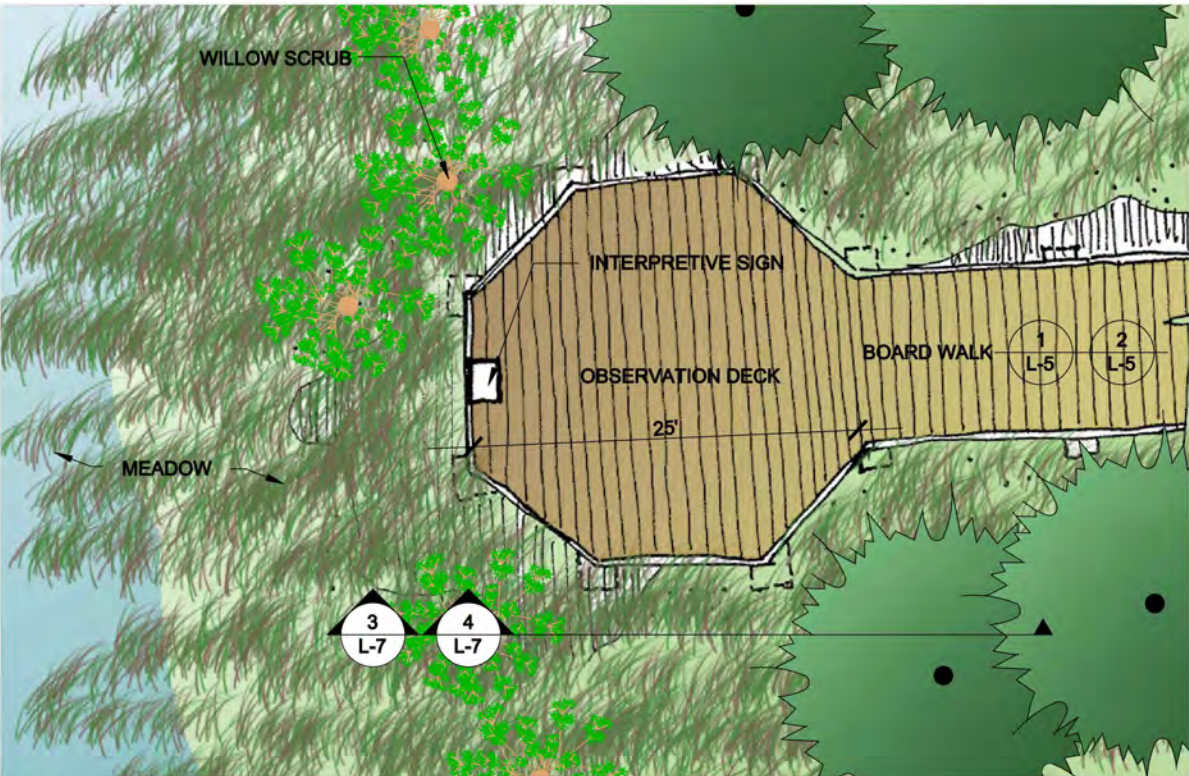
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date: 05/02/12



1
L-7
OBSERVATION AREA (MIN.)
SCALE: NTS

PLAN VIEW



2
L-7
OBSERVATION AREA (MOD./MAX.)
SCALE: NTS

PLAN VIEW



3
L-7
OBSERVATION AREA
SCALE: NTS

ELEVATION



4
L-7
OBSERVATION AREA
SCALE: NTS

REPRESENTATIVE EXAMPLE

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FISHING PLATFORM

L-8

REVISIONS		
#	description	date

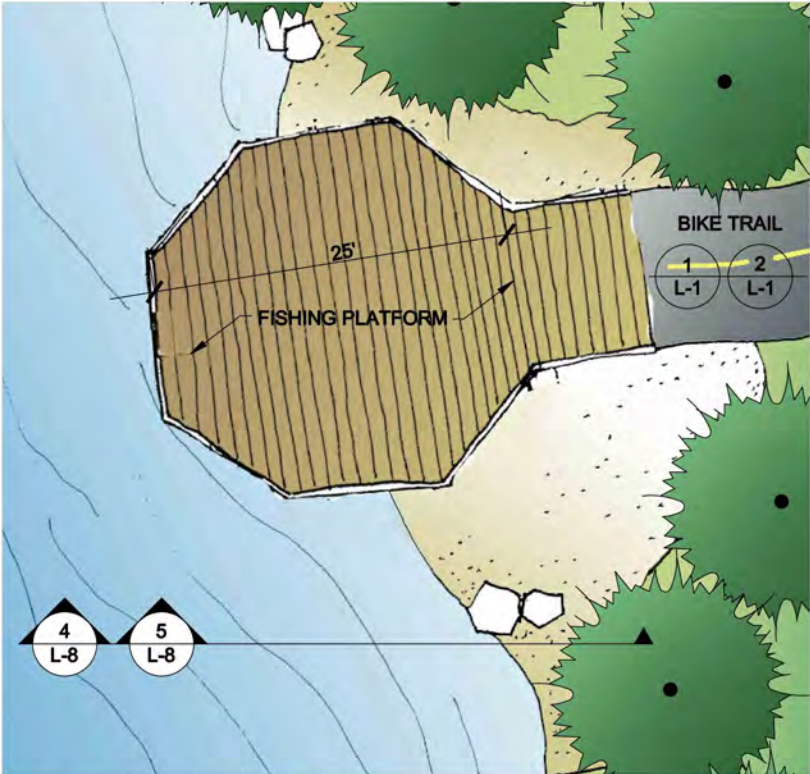
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job no.:	00110066.04
drawn by:	ML
checked by:	JZ

sheet no.: L-8

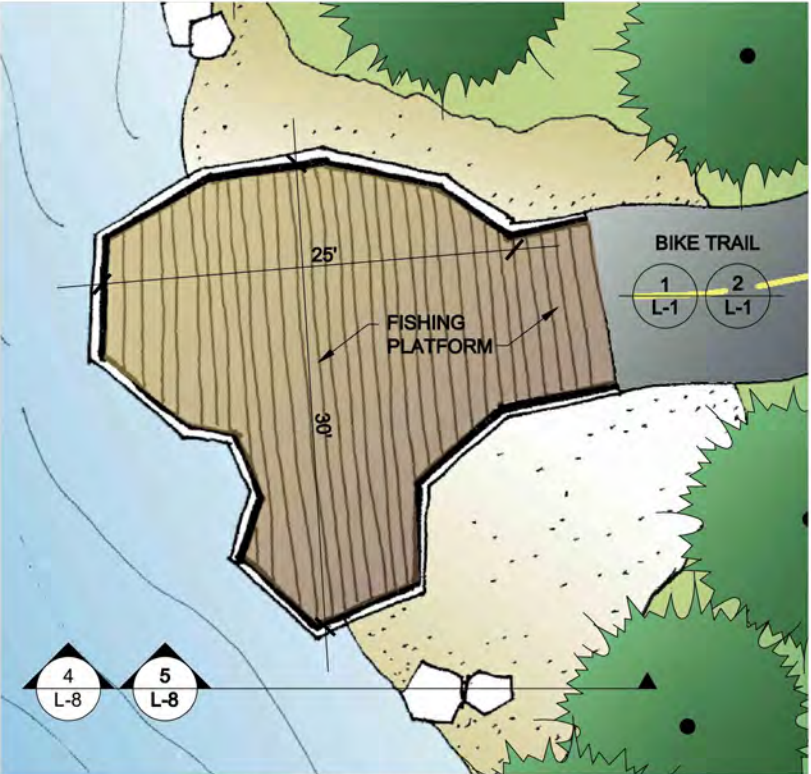
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date: 05/02/12



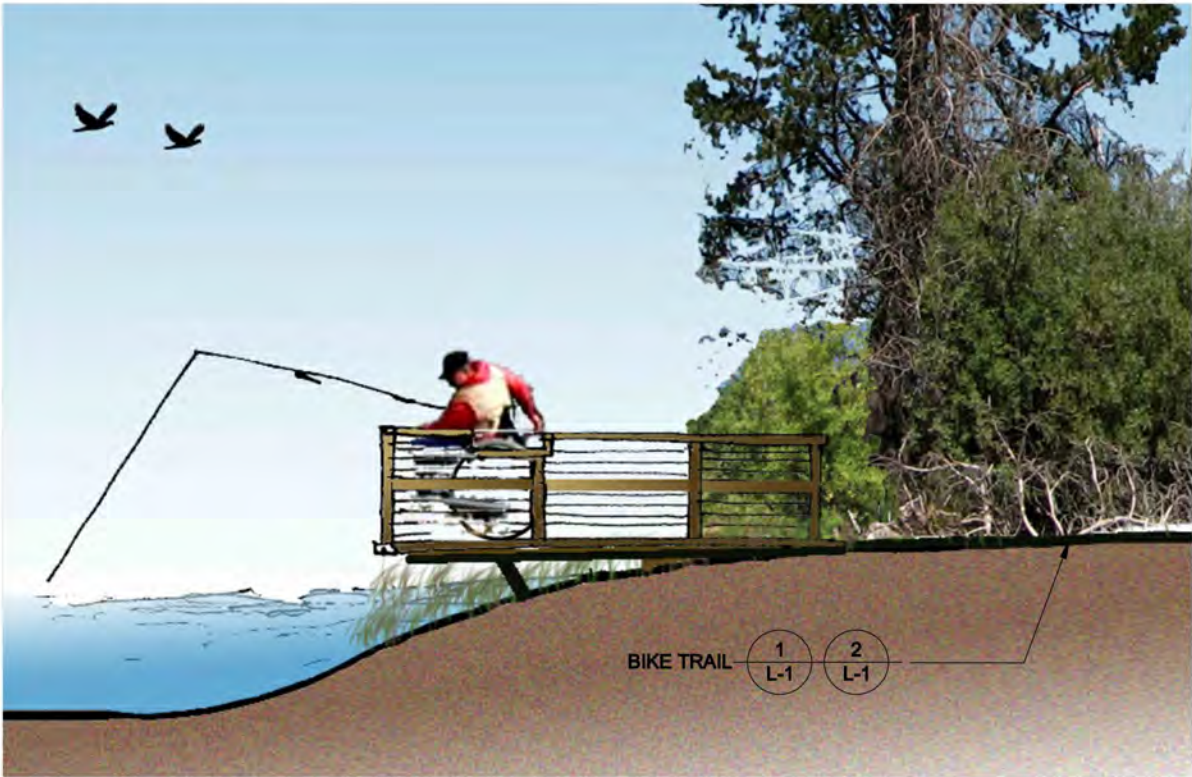
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L-8 SCALE: NTS PLAN VIEW



2 FISHING PLATFORM (MOD.)
L-8 SCALE: NTS



3 FISHING PLATFORM (MAX.)
L-8 SCALE: NTS



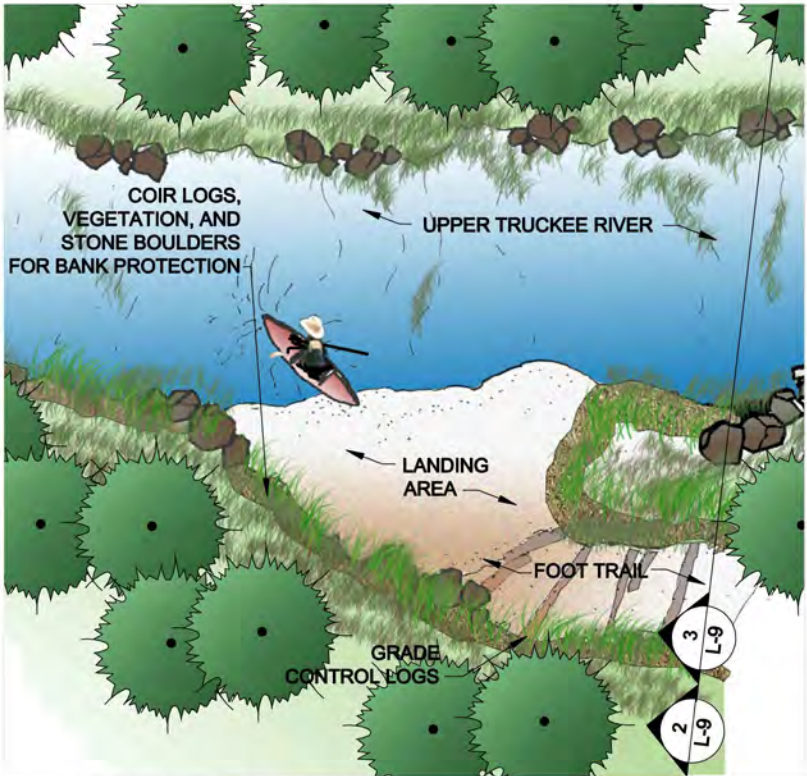
4 FISHING PLATFORM (MIN./MOD./MAX.)
L-8 SCALE: NTS ELEVATION



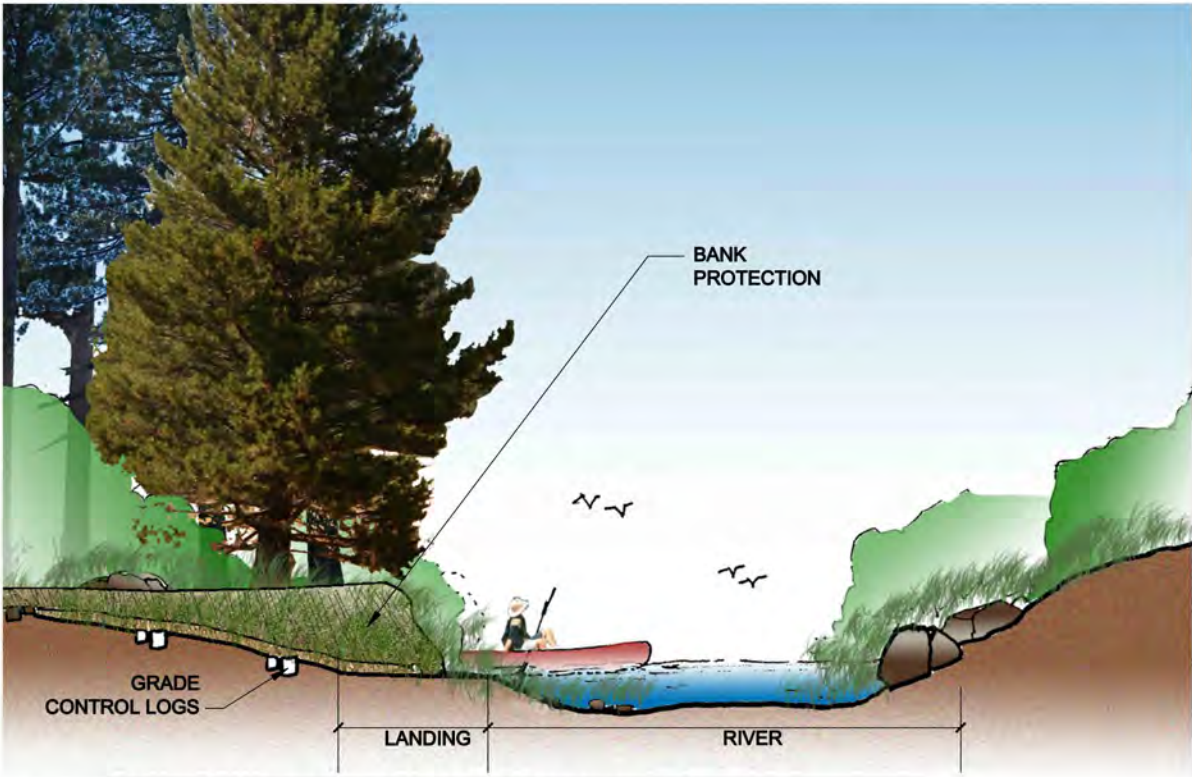
5 FISHING PLATFORM
L-8 SCALE: NTS REPRESENTATIVE EXAMPLE

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SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION



1 EXISTING RIVER ACCESS STABILIZATION
L-9 SCALE: NTS PLAN VIEW



2 EXISTING RIVER ACCESS STABILIZATION
L-9 SCALE: NTS ELEVATION



3 EXISTING RIVER ACCESS STABILIZATION
L-9 SCALE: NTS REPRESENTATIVE EXAMPLE



UPPER TRUCKEE RIVER
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EXISTING RIVER
ACCESS
STABILIZATION

L-9

REVISIONS		
#	description	date

scale:	NOT TO SCALE
job no.:	00110066.04
drawn by:	ML
checked by:	JZ

sheet no.: L-9

sheet 43 of 45
date: 05/02/12

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SCHEMATIC DESIGN PLANS
& DETAILS
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NOTES:
MIN. = MINIMUM RECREATION INFRASTRUCTURE
MOD. = MODERATE RECREATION INFRASTRUCTURE
MAX. = MAXIMUM RECREATION INFRASTRUCTURE



UPPER TRUCKEE RIVER
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KIOSK

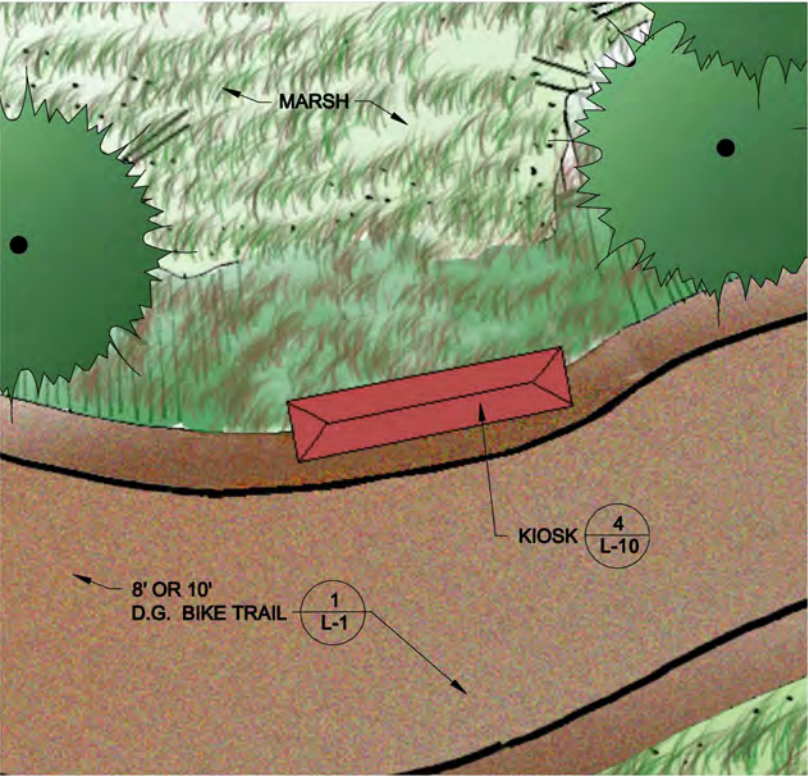
L-10

REVISIONS		
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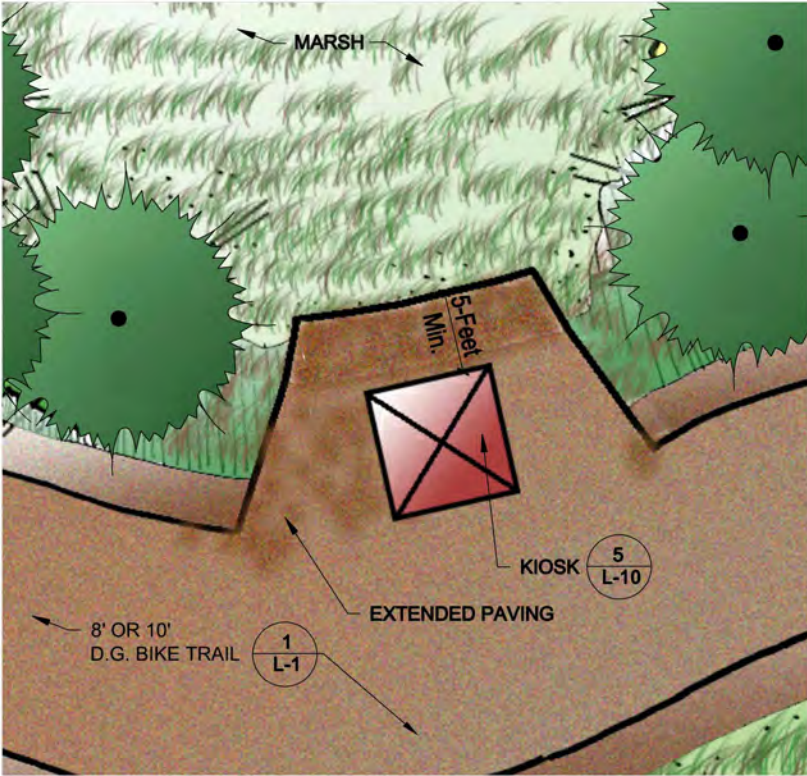
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checked by:	JZ

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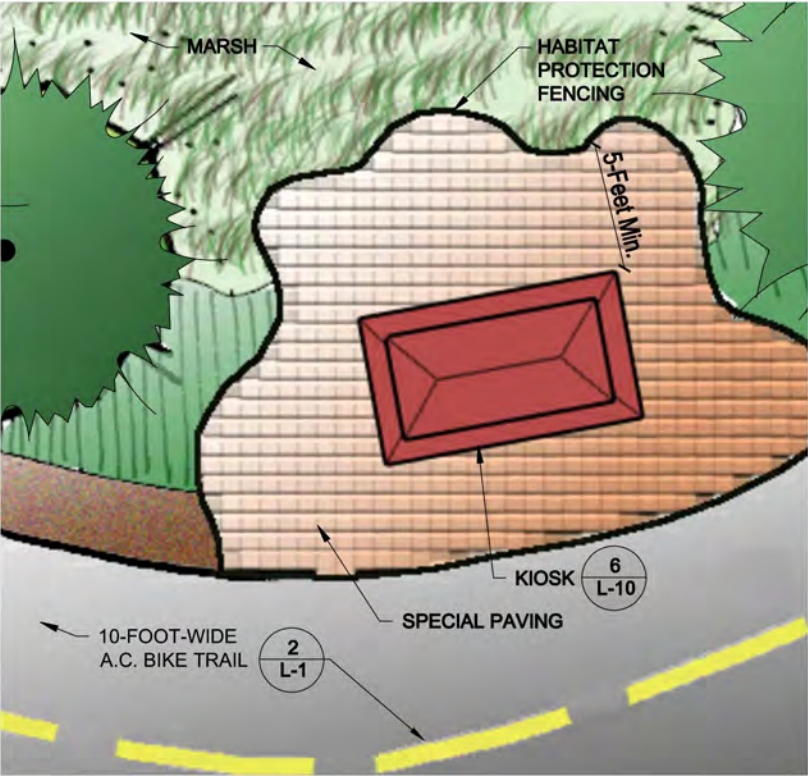
sheet 44 of 45
date: 05/02/12



1 KIOSK (MIN.)
L-10 SCALE: NTS PLAN VIEW



2 KIOSK (MOD.)
L-10 SCALE: NTS PLAN VIEW



3 KIOSK (MAX.)
L-10 SCALE: NTS PLAN VIEW



4 KIOSK (MIN.)
L-10 SCALE: NTS REPRESENTATIVE EXAMPLE



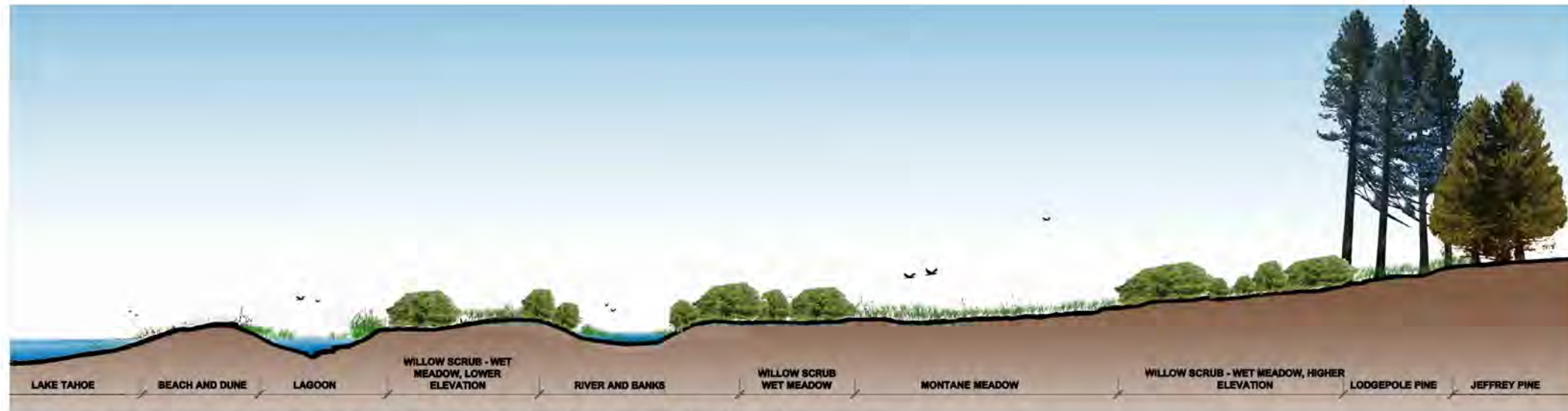
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L-10 SCALE: NTS REPRESENTATIVE EXAMPLE



6 KIOSK (MAX.)
L-10 SCALE: NTS REPRESENTATIVE EXAMPLE

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SCHEMATIC DESIGN PLANS
& DETAILS
NOT FOR CONSTRUCTION



1
L-11 REVEGETATION AND HABITAT RELATIONSHIPS
SCALE: NTS SECTION

PLANT LIST

Scientific Name	Common Name	Growth Form	Beach and Dune	Lagoon	Willow Scrub-Wet Meadow, Lower Elevation	Riverbanks	Willow Scrub-Wet Meadow, Higher Elevation	Montane Meadow	Lodgepole Pine	Jeffrey Pine
<i>Scirpus acutus</i>	Tule	P		X						
<i>Sparganium emersum</i> ssp. <i>emersum</i>	Emerald bur-reed	P		X						
<i>Typha angustifolium</i>	Cattail	P		X						
<i>Achnatherum occidentale</i>	Western needlegrass	G							X	X
<i>Agrostis exarata</i>	Spike bentgrass	G				X				
<i>Alopecurus aequalis</i>	Short-awn foxtail	G		X	X					
<i>Bromus carinatus</i>	California brome	G								X
<i>Carex aquatilis</i>	Water Sedge	G	X	X	X		X			
<i>Carex athrostachya</i>	Blister sedge	G					X	X		
<i>Carex nebraskensis</i>	Nebraska sedge	G	X		X	X	X	X	X	X
<i>Carex utriculata</i>	Beaked sedge	G		X	X		X	X		
<i>Deschampsia cespitosa</i> var. <i>cespitosa</i>	Tufted hairgrass	G					X	X		
<i>Deschampsia danthonoides</i>	Annual hairgrass	G	X							
<i>Eleocharis macrostachya</i>	Common spikerush	G		X	X	X				
<i>Elymus glaucus</i>	Blue wildrye	G					X		X	
<i>Elymus trachycaulus</i> var. <i>intermedia</i>	Intermediate Wheatgrass	G						X		
<i>Festuca rubra</i>	Red fescue	G						X		
<i>Glyceria elata</i>	Fowl mannagrass	G		X	X	X				
<i>Hordeum brachyantherum</i>	Meadow barley	G	X					X		
<i>Hordeum jubatum</i>	Foxtail barley	G	X							
<i>Juncus balticus</i>	Wiregrass, Baltic rush	G	X	X	X	X	X			
<i>Juncus effusus</i>	Common rush	G		X	X	X	X			
<i>Juncus ensifolius</i>	Sword-leaved rush	G				X	X			
<i>Juncus nevadensis</i>	Nevada rush	G	X					X		
<i>Juncus orthophyllus</i>	Straight-leaved rush	G						X		
<i>Leymus triticoides</i>	Creeping wildrye	G	X						X	X
<i>Poa secunda</i> var. <i>nevadensis</i>	Bluegrass	G						X	X	X
<i>Scirpus micropus</i>	Small Fruited Bulrush	G				X				
<i>Achillea millefolium</i>	Yarrow	P	X					X	X	X
<i>Arnica chamissonis</i> var. <i>foliosa</i>	Arnica	P	X					X	X	
<i>Aster occidentalis</i>	Western mountain aster	P	X					X	X	X
<i>Fragaria virginiana</i>	Mountain strawberry	P	X					X	X	
<i>Linum lewisii</i>	Flax	P						X		
<i>Lupinus breweri</i>	Brewer's lupine	P								X
<i>Lupinus lepidus</i> var. <i>confertus</i>	Clustered tidy lupine	P	X							X
<i>Lupinus polyphyllus</i>	Big lupine	P					X	X	X	
<i>Oenothera elata</i> var. <i>hookeri</i>	Evening primrose	P	X							

PLANT LIST CONTINUED

Scientific Name	Common Name	Growth Form	Beach and Dune	Lagoon	Willow Scrub-Wet Meadow, Lower Elevation	Riverbanks	Willow Scrub-Wet Meadow, Higher Elevation	Montane Meadow	Lodgepole Pine	Jeffrey Pine
<i>Penstemon rydbergii</i> var. <i>oreocharis</i>	Meadow beardtongue	P						X	X	X
<i>Phacelia hastata</i>	Silverleaf phacelia	P								X
<i>Polygonum bistortoides</i>	Western bistort	P					X	X		
<i>Potentilla glandulosa</i>	Cinquefoil	P					X	X	X	
<i>Potentilla gracilis</i>	Cinquefoil	P	X				X	X	X	
<i>Sidalcea oregana</i> ssp. <i>spicata</i>	Checker mallow	P				X	X	X	X	
<i>Smilacina stellata</i>	False Solomon's seal	P							X	
<i>Stachys ajugoides</i> var. <i>rigida</i>	Hedge nettle	P					X		X	X
<i>Trifolium longipes</i>	Long-stalked clover	P					X	X	X	
<i>Nuphar luteum</i> var. <i>polysepalum</i>	Yellow pond-lily	P		X						
<i>Polygonum amphibium</i>	Water smartweed	P		X	X					
<i>Polygonum hydropiperoides</i>	Waterpepper	P		X	X					
<i>Rumex salicifolius</i>	Willow-leaved dock	P		X	X	X				
<i>Amelanchier alnifolia</i>	Serviceberry	S							X	
<i>Arctostaphylos patula</i>	Greenleaf Manzanita	S								X
<i>Artemisia tridentata</i> var. <i>vaseyana</i>	Mountain sagebrush	S							X	X
<i>Berberis aquifolium</i> var. <i>repens</i>	Oregon grape	S								X
<i>Ceanothus prostratus</i>	Squaw carpet	S								X
<i>Chrysothamnus nauseosus</i>	Rubber rabbitbrush	S								X
<i>Lonicera conjugalis</i>	Double honeysuckle	S								X
<i>Ribes cereum</i>	Wax currant	S								X
<i>Ribes lacustre</i>	Swamp currant	S					X		X	X
<i>Ribes roezlii</i> var. <i>roezlii</i>	Sierra currant	S								X
<i>Rosa woodsii</i> var. <i>ultramontana</i>	Interior rose	S							X	X
<i>Salix exigua</i>	Narrow-leaved willow	S	X			X				
<i>Pinus contorta</i> var. <i>murrayana</i>	Lodgepole pine	T							X	X
<i>Pinus jeffreyi</i>	Jeffrey pine	T								X
<i>Salix geyeriana</i>	Geyer's willow	T		X	X					
<i>Salix lemmonii</i>	Lemmon's willow	T	X	X	X	X	X		X	
<i>Salix lucida</i> var. <i>lasianдра</i>	Shining willow	T		X	X	X				
<i>Salix scouleriana</i>	Scouler's willow	T					X		X	
Total Number of Species			17.0	15.0	14.0	13.0	19.0	22.0	24.0	24.0

KEY
G - GRASS P - PERENNIAL S - SHRUB T - TREE



UPPER TRUCKEE RIVER
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REVEGETATION
SECTION AND
PLANT LIST

L-11

REVISIONS
description date

scale: NOT TO SCALE
job no.: 00110066.04
drawn by: ML
checked by: JZ

sheet no.: L-11

sheet 45 of 45
date: 05/02/12

APPENDIX D

Construction Workers and Equipment for Action Alternatives

Appendix ' Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Year 1					
Mobilization (Alt. 1–4)	5	5	5	5	20 ton Dump Truck (Multiple); Cat 120H Motor Grader; Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Re-contoured Existing Channel (Alt. 1, 3)	6	-	6	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12” and 10” Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Lowered Floodplain (Alt. 1–4)	5	5	6	6	Alt. 1–3: 20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (2); Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2) Alt. 4: same as Alt. 1–3, except 20 ton Dump Truck(3)
Inset Floodplain (Alt. 4)	-	-	-	8	20 ton Dump Truck(6); Cat D6 Dozer; Cat D9 Dozer(2); Cat 330 Excavator (2); Cat 420E Backhoe Loader; Aquadam Water-Filled Berm; Water Truck; 1 Ton Pickup Truck (2)
Existing Secondary Channel (Alt. 1–4)	3	3	3	3	Alt. 1 and 2: 21 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (2); Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2) Alt. 3 and 4: 20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12” and 10” Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
New Channel (Alt. 1)	10	-	-	-	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (3); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12” and 10” Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
New Channel and River Mouth Modification (Alt. 2)	-	10	-	-	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (3); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12” and 10” Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)

Appendix ' Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
New Channel and Vertical and Lateral Grade Controls (Alt. 3)	-	-	10	-	20 ton Dump Truck (Multiple); Cat D6 Dozer (2); Cat D9 Dozer (2); Cat 330 Excavator (3); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Revegetation/Irrigation (Alt. 1-4)	8	8	4	8	Cat D6 Dozer w/scarifier; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Bobcat Trencher; Water Truck; 1 Ton Pickup Truck (2)
Winterization (Alt. 1-4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Year 2					
Mobilization (Alt. 1-4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat 120H Motor Grader; Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
New Channel and Lowered Floodplain (Alt. 1)	3	-	-	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
New Channel, River Mouth Modification, and Lowered Floodplain (Alt. 2)	-	3	-	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
New Channel, Recontoured Existing Channel, Existing Secondary Channel, and Lowered Floodplain (Alt. 3)	-	-	3	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Existing Secondary Channel, Inset Floodplain and Lowered Floodplain (Alt. 4)	-	-	-	4	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Bank Protection (Alt. 1-4)	7	7	7	7	20 ton Dump Truck; Cat D6 Dozer; Cat 330 Excavator (2); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Overflow culverts (Alt. 3)	-	-	5	-	Cat D6 Dozer; Cat 420E Backhoe Loader; Cat TL642 Forklift; Jack and Bore Drill Rig; Water Truck; 1 Ton Pickup Truck (2)

Appendix ' Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Vertical Grade Controls (Alt. 1)	6	-	-	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Vertical grade controls and River Mouth Modification (Alt. 3)	-	-	6	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Restored Floodplain (Alt. 4)	-	-	-	6	20 ton Dump Truck (Multiple); Cat D6 Dozer (3); Cat D9 Dozer (3); Cat 330 Excavator (3); Cat 420E Backhoe Loader; Cat TL642 Forklift; Aquadam Water-Filled Berm; Water Truck; 1 Ton Pickup Truck (2)
Recontoured Existing Channel (Alt. 4)	-	-	-	8	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Bulkhead and Levee (Alt. 1-3)	5	5	5	-	Barge Mounted Pile Driver; 20 ton Dump Truck (multiple); Cat D6 Dozer (2); Cat D9 Dozer; Cat 330 Excavator (2); Cat 825 Compactor; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (3); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Restored Lagoon (Alt. 1-3)	4	4	4	-	Cat D6 Dozer w/scarifier; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Water Truck; 1 Ton Pickup Truck (2)
Revegetation/Irrigation (Alt. 1-4)	8	8	8	8	Cat D6 Dozer w/scarifier; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Bobcat Trencher; Water Truck; 1 Ton Pickup Truck (2)
Winterization (Alt. 1-4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)

Appendix ' Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Year 3					
Mobilization (Alt. 1–4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat 120H Motor Grader; Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
New Channel, Re-contoured Existing Channel, and Lowered Floodplain (Alt. 1)	4	-	-	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
New Channel, River Mouth Modification, and Lowered Floodplain (Alt. 2)	-	4	-	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Re-contoured Existing Channel, Existing Secondary Channel, and Lowered Floodplain (Alt. 3)	-	-	4	-	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Existing Secondary Channel, Inset Floodplain, Lowered Floodplain, and Re-contoured Existing Channel (Alt. 4)	-	-	-	4	Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Excavation of Reserve Fill at Lower West Side and fill at TKPOA yard (Alt. 1, 2, and 3)	6	6	6	-	20 ton Dump Truck (Multiple); Cat D6 Dozer (3); Cat D9 Dozer (3); Cat 330 Excavator (3); Cat 420E Backhoe Loader; Cat TL642 Forklift; Aquadam Water-Filled Berm; Water Truck; 1 Ton Pickup Truck (2)
Public Access and Habitat Protection Features (Alt. 1, 2, and 4)	15	15	15	15	20 ton Dump Truck; Cat D6 Dozer (2); Cat D9 Dozer(2); Cat 330 Excavator (3); Cat 120H Motor Grader; Cat 825 Compactor; Cat BG-225 Asphalt Paver; Cat 420E Backhoe Loader; Cat TL642 Forklift; Water Truck; 1 Ton Pickup Truck (2)
Restored Lagoon (Alt. 1 and 2)	4	4	-	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); 12” and 10” Dewatering hose/pipe; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Water Truck; 1 Ton Pickup Truck (2)
River Mouth Modification (Alt. 1)	5	-	-	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12” and 10” Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)

Appendix D Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Restored Dunes (Alt. 1 and 2)	3	3	-	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Water Truck; 1 Ton Pickup Truck (2)
New Channel and Re-contoured Existing Channel (Alt. 1)	8	-	-	-	Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (2); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (3); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
New Channel and River Mouth Modification (Alt. 2)	-	10	-	-	Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator (2); Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (3); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Vertical and Lateral Grade Controls (Alt. 1, 2, and 3)	6	6	6	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Partial Backfill and Complete Backfill Old Channel (Alt. 1, 2, and 3)	8	8	8	-	20 ton Dump Truck (Multiple); Cat D6 Dozer (2); Cat D9 Dozer (2); Cat 330 Excavator (2); Cat 420E Backhoe Loader; Cat TL642 Forklift; Cat 825 Compactor; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Rain for Rent DV-300 5000 GPM Electric Pump (3); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Restored Lagoon (Alt. 1, 2, and 3)	3	3	3	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Rain for Rent DV-300 5000 GPM Electric Pump (2); Aquadam Water-Filled Berm; 12" and 10" Dewatering hose/pipe; Water Truck; 1 Ton Pickup Truck (2)
Restored Floodplain (Alt. 1, 2, and 3)	6	6	6	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Water Truck; 1 Ton Pickup Truck (2)
Stormwater Treatment Basins (Alt. 2 and 3)	-	4	4	-	20 ton Dump Truck; Cat D6 Dozer; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)

Appendix D Construction Workers and Equipment for Action Alternatives					
Activities/Engineered Feature	Construction Workers (#)				Construction Equipment
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	
Revegetation/Irrigation (Alt. 1–4)	8	8	8	8	Cat D6 Dozer w/scarifier; Cat D9 Dozer; Cat 330 Excavator; Cat 420E Backhoe Loader; Cat TL642 Forklift; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Bobcat Trencher; Water Truck; 1 Ton Pickup Truck (2)
Winterization (Alt. 1–4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Year 4					
Mobilization (Alt. 1–4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat 120H Motor Grader; Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Water Truck; 1 Ton Pickup Truck (2)
Revegetation/Irrigation (Alt. 1–4)	4	4	4	4	Cat TL642 Forklift; Cat 420E Backhoe Loader; Bobcat Trencher; Water Truck; 1 Ton Pickup Truck (2)
Winterization and Project Shutdown (Alt. 1–4)	4	4	4	4	20 ton Dump Truck (Multiple); Cat D6 Dozer; Cat D9 Dozer; Cat TL642 Forklift; Cat 420E Backhoe Loader; Truck Mounted Hydroseeder; Trailer Mounted Straw Mulcher; Water Truck; 1 Ton Pickup Truck (2)

APPENDIX E

Alternative Cost Estimates

INITIAL COST ANALYSIS

In 2006, estimated costs for each Alternative were developed using standard cost estimating practices for civil engineering and environmental restoration projects. This information was created for the Concept Plan Report prepared for the project in 2006 and represents the alternatives at this stage in some instances features have been added or deleted and therefore do not represent the most current alternatives. The purpose of this section was simply to provide a relative representation of the costs of the various alternatives. A summary of the results are presented in the following table. Table 1 provides estimated costs based on estimated quantities and information available at that time. They were developed for planning purposes only and based on best available information.

In order to evaluate the four alternatives, general assumptions were made and applied similarly to each alternative. These included typical cross-sections of new channel, typical cross-sections of existing channel to be filled, spacing of habitat improvement features, construction access road width and length, etc. Unit costs were derived using a combination of actual costs from LWS and Trout Creek Restoration projects, cost publications like RSMeans Site Work and Landscape Cost Data, data provided by resource agencies like Washington State Department of Fish and Wildlife and Alaska Department of Fish and Wildlife, and the design teams extensive knowledge of the site and professional experience. Design and permitting costs were included as 40% of construction.

Based on total cost, Alternative 3 is least expensive, followed by Alternative 2, 1, and 4. Total costs range from \$5.9M for Alternative 3 to \$19.7M for Alternative 4. This large range is due primarily to the differences in earthwork volumes and level of recreation infrastructure. If only site work, contractor costs, design and permitting costs are considered, since the three levels of recreation infrastructure, maximum, moderate and minimum, could be easily applied to any of the 4 alternatives, the only change in the resulting ranking is that Alternative 1 and 2 are switched.

Description		Alternative 1	Alternative 2	Alternative 3	Alternative 4
Recreation/Public Access					
	Visitor Center	\$900,000	\$0	\$100,000	\$100,000
	Boardwalk	\$500,000	\$0	\$287,500	\$262,500
	Public Access Trails	\$45,000	\$13,800	\$31,050	\$23,100
	Overlook/Viewing Platform	\$67,500	\$45,000	\$60,000	\$45,000
	Signage	\$31,500	\$21,000	\$28,000	\$21,000
	Decorative Fencing	\$600,000	\$200,000	\$400,000	\$400,000
	Subtotal	\$2,144,000	\$279,800	\$906,550	\$851,600
Site Work					
	Site Preparation/ Clearing	\$5,875	\$13,750	\$6,150	\$22,335
	Access Roads/Channel Crossings	\$150,900	\$186,000	\$94,500	\$9,000
	Channel Construction	\$1,200,220	\$1,615,075	\$155,540	\$10,067,540
	Channel Backfill (off-site borrow, in-basin)	\$0	\$644,125	\$285,000	\$0
	Channel Backfill (on-site borrow)	\$325,330	\$350,000	\$350,000	\$70,000
	Bank Stabilization/Protection	\$900,000	\$900,000	\$900,000	\$900,000
	Habitat Structures (200 ft spacing)	\$32,000	\$43,000	\$10,000	\$47,000
	Lateral Grade Controls	\$12,500	\$15,000	\$2,500	\$0
	Vertical Grade Controls	\$180,000	\$60,000	\$60,000	\$0
	Irrigation System	\$255,000	\$255,000	\$255,000	\$255,000
	Revegetation/Erosion Control	\$150,000	\$150,000	\$150,000	\$150,000
	Dewatering	\$250,000	\$250,000	\$250,000	\$250,000
	Bulkhead	\$250,000	\$250,000	\$250,000	\$0
	Construction Fencing	\$80,000	\$80,000	\$80,000	\$80,000
	Subtotal	\$3,791,825	\$4,811,950	\$2,848,690	\$11,850,875
Contractor Costs					
	Mobilization/Demobilization	\$379,183	\$481,195	\$284,869	\$1,185,088
	Surveying	\$10,000	\$10,000	\$10,000	\$10,000
	Road Repair	\$100,000	\$100,000	\$100,000	\$100,000
	Staging/Laydown	\$50,000	\$50,000	\$50,000	\$50,000
	Subtotal	\$539,183	\$641,195	\$444,869	\$1,345,088
Design and Permitting					
	Design (20%)	\$1,295,002	\$1,146,589	\$840,022	\$2,809,513
	Permitting (20%)	\$1,295,002	\$1,146,589	\$840,022	\$2,809,513
	Subtotal	\$2,590,003	\$2,293,178	\$1,680,044	\$5,619,025
	Total	\$9,065,011	\$8,026,123	\$5,880,153	\$19,666,588